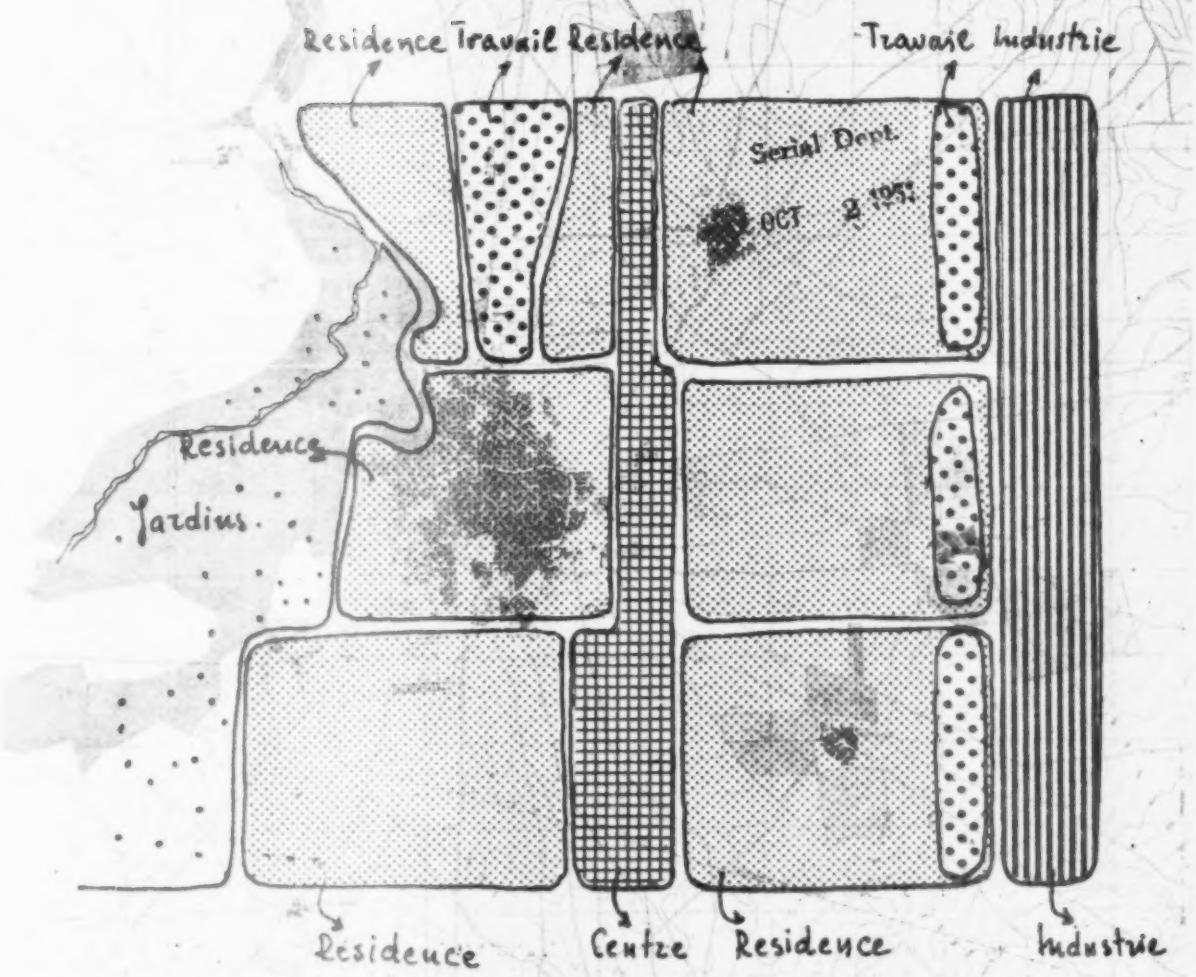
EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

OCTOBER • 1960



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E K I S T I C S

ABSTRACTS

of

THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

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Consulting Engineers
24, Strat. Syndesmou
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EKISTICS is compiled by Mrs. Gwen Bell under the direction of Prof. J. Tyrwhitt.

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EDITORIAL

The two main themes of this month's EKISTICS are both reflected in the first article "Bulldozer Architecture." The possibilities opened up by the use of large-scale earth-moving has given rise to various results, some of which enhance the living environment, and others which destroy it. This article illustrates some of the more positive results: its mis-uses were pointed out in a series of articles in EKISTICS 10:57, July 1960, pages 45-51.

LIVEABILITY

The concern with liveability has shifted from standards of health and safety to the more psycho-sociological aspects of living. Five different approaches are presented. Allison and Peter Smithson (British architects) have prepared a list of criteria for mass housing. A good part is occupied by design elements which tend to cause anxiety to the inhabitants, thus emphasizing the shift of emphasis from the physical to the psychological. Answers to the queries they raise are--probably purposely--left vague. Emphasis throughout their list is as much or even more upon the 'extensions of the dwelling' than its interior planning, showing their inheritance from the CIAM tradition.

This interest in the social aspects of research into liveability standards is again brought out by a world-wide survey conducted under the auspices of the United Nations into the main trends of current research. The United Nations has been concerned with the problems of housing from a number of angles, and Margaret Hockin, of FAO's home economics branch, writes on the importance of community development and education within the social context of the group, as a means of improving the conditions of living of the people.

From Japan, a member of the Building Research Institute presents the results of a re-study of the 'neighbourhood unit' concept. He concludes that this is a satisfactory unit and comes up with a 'community district' of some 50,000 people, which roughly corresponds to the Doxiadis Class IV community. Like Doxiadis, he conceded that this community can then be broken down into sub-units, but he rightly stresses that these are not complete in themselves but merely part of the larger unit, which he believes to be the smallest 'unit' workable under present-day conditions to satisfy the ordinary needs of an urban citizen.

The cheering and invigorating effect of a fresh coat of paint is described by the Urban Renewal Administration of the USA, and this brief abstract is followed by an article on the problems of mould upon paint in humid areas, especially in the tropics, from the British Building Research Station.

LARGE SCALE PLANNING

Rapid economic development is a major goal of all of the less developed countries, and this is mainly sought through national and regional plans. The great problem everywhere is how to keep ahead of the ever-increasing growth of population, as illustrated on a map, page 238. The difficult problem of foreign assistance in promoting economic development in areas, which differ vastly from country to country and region to region was the subject of a lengthy session of the American Economic Association at its 72nd annual meeting. Three of the papers presented are abstracted here together with an abstract of the general summary by Albert O. Hirschman. The case is made out in the first that economic growth only comes about when there is a situation of social ferment which induces rebellious, creative people to arise. The second stresses that advances in agriculture are assisted and are promoted rather than hindered by the introduction of industrialization. The third gives a careful summation of relations between government intervention and economic progress under certain conditions.

A critical study of Ceylon's 10 year plan follows from one of the foreign experts invited to work with the National Planning Council of Ceylon. He points out that the realistic aim can only be to introduce enough industrialization to maintain existing standards for the increasing population. Any actual raising of the standard of living is unrealistic under the present population pressure.

An account of the successful exploitation of the natural resources of the Tennessee Valley must be weighed against the fact that its population increased merely from 3 million to 3.6 million over a period of 25 years, as well, of course that this pocket of under-development was surrounded by an area of high development which could both absorb its products and supply it with capital. The development programmes for the water resources of S.E. Asia are on a much simpler scale, and indeed still at a stage of survey rather than regional planning. As a footnote to the problems of regional planning in under-developed areas, an article is included on techniques suggested for remote areas in Australia.

CURRENT WORK OF DOXIADIS ASSOCIATES

A brief account is given of the process from survey to outline plan for a city in the Syrian Province of the United Arab Republic. The lack of exact data handicapped the survey, but the lines upon which the plan has been drawn out are both bold and interesting, and seem to permit the rapid industrial development of this city without wantonly destroying its natural heritage.

Miller, Richard A.
BULLDOZER ARCHITECTURE
Architectural Forum, Volume 113, Number 2. August 1960. Pages 84-91. Illustrations.
624.132 (100)

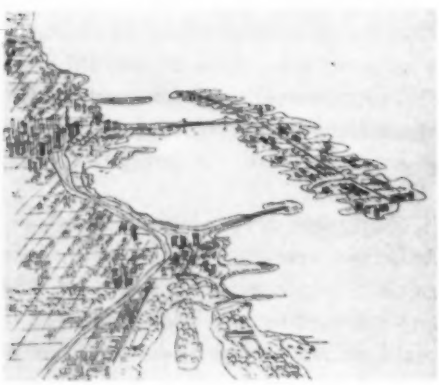
1. The combination of today's economics, technology and men, make earth moving too easy. In less than an hour one man and a single powerful machine can destroy a thousand years of natural growth in soil and trees, and there place a new landscape is too often constructed that cannot work: a careless, formless, badly functioning world that never quite recovers from the shock. But as always, there is another possibility. When earthwork becomes an art it can be wondrous indeed. Many ancient constructions and a few contemporary projects show the way.

2. Not since the building of renaissance fortifications like those at Naarden in the Netherlands (see page 222) has there been so much thought about the conscious shaping of the earth for purposes both formal and functional. In architecture, buildings are artfully being situated on sites as impressive as an Inca ruin, like Machu Picchu in Peru (See EKISTICS 10:57 page 39, July 1960). And sometimes the earth itself, for its own sake, is being shaped, terraced, and mounded like ceremonial Indian effigy mounds, albeit for less urgent reasons.

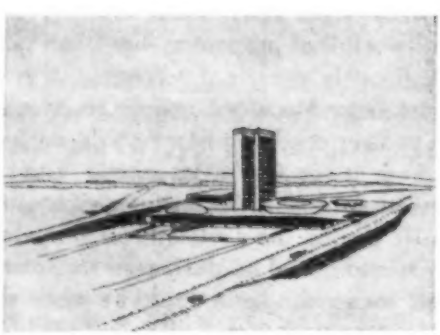
3. Detroit is a case in point. Noticing that engineers estimated a cost of $40 million over the next ten years merely to remove expressway excavation earth from the city to fill outlying sites, Detroit's director of city planning, Charles A. Blessing, is starting a program to use the fill on the river front and in city parks to build features ranging from sledding hills to an "Acropolis" replete with amphitheaters and stadiums. "In ten years," says Blessing, "we'd turn Detroit from a flat city to a hilly one, and save $11 million doing it if we could use that earth in town."

4. In Chicago in 1952, Blessing was one of the men behind a seemingly fantastic proposal to build a new city 14 miles long on artificial linear islands 1.5 miles off the Lake Michigan shore. In the official city view the idea was branded utopian fantasy, but Chicago architect, Harry Weese, one of the original proposers, has been persistently advancing the idea which he considers eminently practical. Weese, who likes to suggest that half of the city lies 35 feet under Lake Michigan waitng to become an "Atlantis in reverse," says that a 40,000 horsepower dredging plant could deliver fill from lake bottom through a 42-inch pipe from as far as 5 miles away. The proposed islands would be built up from a shelf in the lake only 35 feet under water. Fill would be pumped into rock coffer dams built around the perimeter of the islands. Eighty thousand cubic yards of fill per acre of island could be delivered for something like 20 cents a yard for clay and 50 cents for sand. Land could be made ready for building for about $1.65 a square foot, including streets and utilities. This is only one-sixth the cost of in-town apartment or town-house sites.

Earthwork moat *and fortifications in a star shape (right) were built around the medieval town of Naarden in the Netherlands after the French captured the town in 1672. A second range of defenses were erected later, when the increased range of artillery made them necessary.*



Man-made islands *proposed by Architect Harry Weese for a position 1¼ miles offshore from Chicago (right) would be built up 35 feet from Lake Michigan's floor by dredging operations. A 14-mile-long linear city would be arranged along a highway spine, spaced with parks, lagoons, and residential blocks.*



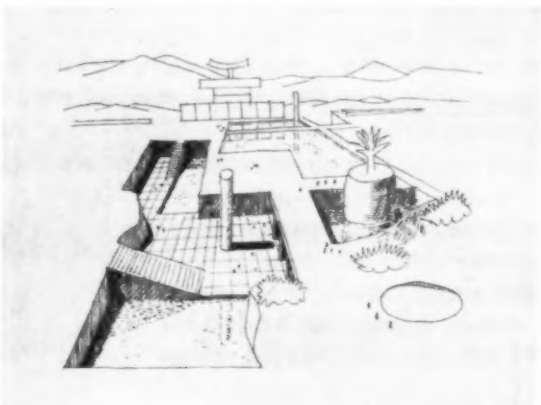
Elevated highways *on earth fill at Brasilia (left) lead directly to an upper-level terrace for the assembly building and secretariat. This building group by Architect Oscar Niemeyer is at the focus of the airplane-shaped plan for the new capital city.*

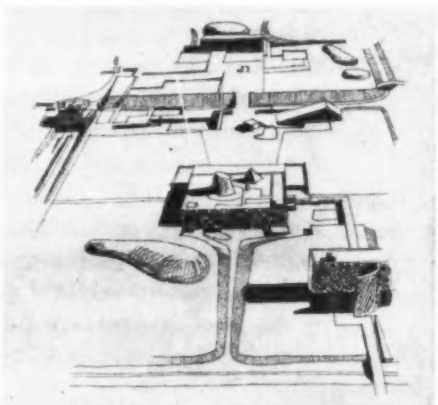
CHARLES TASNADI

Helicoid *shopping center (above) now being built in* **Caracas** *required moving 1.8 million cubic* **yards** *of rock to provide a winding continuous street of shops around the mountain peak.*

Depressed courtyards and pools *of Governor's Palace proposed for Chandigar,* **India** *(below) is only one of the earth-sculpture features of LeCorbusier's government center.*

Earth mounds *will help isolate and define Chandigar's government center (below) from the more casual city around it. The mounds also echo the Himalayan mountain background.*





Smithson, A. and P.
CRITERIA FOR MASS HOUSING
Forum No. 1, 1960. Pages 16-17.
333.322 (100)

1. The term Mass Housing applies to all dwellings not built to the especial order of an individual: houses for which therefore, the architect has a peculiar responsibility.

A. QUESTIONNAIRE

2. The Dwelling
   a. Can it adopt itself to various ways of living?
   b. Are the spaces moulded exactly to fit their purpose? Or are they by-products of structural tidiness or plastic whim?
   c. Is there a decently-large open-air sunlit space opening directly from the living area of the house?
   d. Can the weather be enjoyed?
   e. Are there extensions of the dwelling (garden, patio, etc.) appreciated from the inside?
   f. Does it take account of the 3-5 year olds' play?
   g. Is it easy to maintain?
   h. Is there a place for the belongings or special tasks peculiar to the occupants (camping gear, mending motor bikes, etc.)?
   i. Is there enough storage?
   j. Can the dwellings be put together in such a way as to contribute something to each other?
   k. Is the house as comfortable as a car of the same year?
   l. Is the technology suitable to house construction: does it take account of electrical runs and do without traditional 'style-leftovers,' such as door frames?

3. The Immediate Extensions of the Dwelling
   a. Has the relationship between the dwelling and its means of access been chosen for some good reason?
   b. Does reason include 3-5 year olds' play, if not, where do they play?
   c. Does the idea for the dwelling produce an absolutely clear external image? (identity)
   d. Can these images add up to a composite one and is this composite socially valid?
   e. Are the extensions of the dwelling sensible in relation to the physical environment and the activities of the occupants?
   f. Are the gardens and streets necessary to the life of the occupants or are they irrelevant to it?
   g. Is the delivery and collection antiquated and laborious?
   h. Is it a labour to go out or return home?
   i. Does the public vertical circulation really work?
   j. If the development was isolated--would it look like a camp?

4. The 'Living Unit'
   a. Is the scale of the unit related to the size of the parent community?
   b. Is the work pattern of the community understood with all its implications for the unit?
   c. Does it fit the site with its climatic and physical peculiarities, its existing build and human structure, and accept their ecological implications bearing in mind that we are concerned with renewal?
   d. Where do the 5-12 year olds go to? And what do they have to do?
   e. Can the unit support shops? And where are the natural 'pressure points' for such facilities? Are the community facilities a social mirage or are they real?
   f. Where can November 5th be celebrated? (Bonfire night, Bastille Day, 4th of July, etc.)
   g. Is there something worth looking at out of every dwelling or does one merely stare out at another dwelling opposite?
   h. Does the development offer protection and shelter of the same order as the parent community?
   i. Is the unit really generated by an objective study of the situation or are we just saying that it is?

B. SOURCES OF ANXIETY

5. One hundred years ago reformers and ultimately public opinion, agreed that it was necessary to have certain minimum standards to maintain the physical health of the community as a whole. These standards concerned drainage, ventilation, etc. The general raising of living standards suggests that it is time to take another step forward and set up additional standards to safeguard mental health. Towards this end factors of strain caused by an inadequate environment and manifesting themselves in 'anxiety' have been investigated.

6. Flat Dwellings
   a. The 'house' does not actually belong to the inhabitant, engendering insecurity and lack of pride in ownership.
   b. Responsibility for upkeep ambiguous, therefore clash of personal standards on such things as cleaning of hallways, etc.
   c. Close (encircling) feeling of neighbours and actual proximity as regards noise, etc.
   d. Heights above ground arbitrary: There is no expression in the means of access, construction, or the flat type that there is any difference in altitude; or indeed that one has left the ground at all.
   e. Lack of 'equivalents' of traditional amenities and accoutrements which have been built up for the way of life on the ground.
   f. No real place for children to go and play specific to their age group and suitably related to the dwellings.
   g. Unspecific storage and poor relationship to larger possessions (prams, cars, etc.) which engenders disrespect of possessions.

h. No human reason for being raised in the air, no tangible gain from being lifted off the ground.
i. Lack of choice, and no choice of opting out of compulsory contact on landings, lifts, stairs, access balconies, etc.
j. The relationship of family life lifted up in the air to the rest of the town or city has not been considered.
k. Feeling of isolation the result of j., feeling of extra length to shops, to entertainment, etc.
l. If the development answers only by law and health standards and is consequently like barracks or filing cabinets, it can be as soul destroying as slums, and similarly without hope.

7. Housing Estates
a. However sparse the traffic, where the road is the only form of access and the natural communal area between houses, it is a constant source of anxiety for mothers of young children.
b. There is no real place for children to play of any age. Or place for teenagers to go.
c. The involuntary contact with one's immediate two neighbours is liable to be an embarrassment (these two to the exclusion of all others), therefore everyone tends to be standoffish.
d. Distance to everywhere.
e. Cost of going everywhere.
f. New forced charges on household.
g. No useful outdoor area.
h. Break of contact with the old social set-up of extended family in the area of origin, creates mental disturbances most particularly in the housewife who is most cut off and who most relief on 'Mum' being round the corner, and a welter of baby-sitters and help and advice at all times.
i. There is no way of making friends simply by going about one's business that can replace the close knit extended family life and the day-to-day help, reassurance and mutual support it can give.
j. Replacing an easy going attitude, and a certain amount of satisfaction (or at least an uncritical complacency) with things in the old urban areas, is the competitive rat race of the housing estate (or suburbs or new town).
k. Money for travel, for forced expenses and competitive forced buying leave a constant money worry.
l. A car is often a necessity just to get anywhere or get out as a family.
m. Long way to centres of entertainment. The 'local' has disappeared. Television becomes a necessity.
n. The way of life implied by the house--the tying of the inhabitants to the competitive race as the only social act, is not satisfying to the housewife. It is a repetitive boring existence.
o. The situation is likely to continue in Britain because the method of renting the houses in Council Estates is 'democratic' that is, it works off a housing

list made up from demands for houses from many districts. No priority is given to young people marrying in the area who might want to stay, or to relations or friends who might want to live nearby. So the population is forced to change, creating all the time new groups of anchorless young people on other new estates, condemning most developments to a majority of a certain age group--or at least in the formative years.

8. Pollution
   a. Soul destroying round of cleaning, which is so easily undone by a change in weather, chance industrial effects, accidents, and just by people (dirty fingers).
   b. Constant sapping of money by need for cleaning materials.
   c. Destructive forces working constantly on one's possessions engenders an eventual total lack of respect for anybody's object and things.
   d. These man made forces also bring about a certain lack of hope, even hope against change or better conditions.
   e. All this affects health-physical and mental- and wears on the day-to-day actions of people, one to another, which in turn creates tension and so on.
   f. The pollution kills vegetation, or at best mutilates it.
   g. Less sun gets through. Rain cannot ever cleanse.
   h. The built world becomes a light eater.
   i. Depressing effect of dirt not only visual and sensual but also tactile (even so-called clean upholstery is sticky with soot).
   j. Colour becomes geared down not to show the dirt.
   k. In all, there is a restraining effect on everyone (for children, railings are untouchable, etc.)--a hopeless acceptance that an individual cannot make any change, except a destructive one.

9. Noise
   a. Difficulty of concentration.
   b. The exhaustion of having to constantly pitch one's voice above the noise.
   c. Certain noises in certain situations reach pain level--drills, tube trains.
   d. Feeling that it is caused by obsolete equipment and way of life anyway.
   e. The urge it leaves with one to move on, get a move on, hurry.
   f. Feeling of being left out, left behind, that it is all too much and on top of one.

Auger, Pierre

SURVEY ON THE MAIN TRENDS OF INQUIRY IN THE FIELD OF THE NATURAL SCIENCES, THE DISSEMINATION OF SCIENTIFIC KNOWLEDGE AND THE APPLICATION OF SUCH KNOWLEDGE FOR PEACEFUL ENDS

United Nations Economic and Social Council. Mimeographed Paper. 404 pages. 8 annexes.

001 (100)

1. Professor Pierre Auger, a special consultant prepared this lengthy and detailed report for the United Nations. EKISTICS is abstracting particular observations from this report which deal with building and construction. To put this into the frame of Professor Auger's report, what he has observed as the main research trends throughout all the natural sciences are: (a) the extension of physical frontiers, (b) the extension of chemical frontiers, (c) automation, (d) exploration, (e) man against nature, (f) natural balances and cycles, (g) energy, (h) analysis of the structure of matter, (i) synthesis of complex structures, (j) transport, (k) communications, and (l) interaction between the various sciences.

CONSTRUCTION

2. Building research, like building itself, covers a wide range of operation. The most distinctive feature of building research is probably the fact that, to a greater or lesser degree, it enlists the combined efforts of research workers in different branches of science, or under different employers or else involves, as a completely separate combined operation, a building designed on entirely new lines.

3. Study of the prerequisites for the habitability of buildings. Studies in this field have hitherto been mainly concerned with hygrothermal requirements, frequently with reference to the extreme conditions for manual work. They should be extended into the field of acoustical comfort in the various waking states and during sleep. Studies are being made of the permissible degree of air pollution.

4. Investigations are in progress, and should be extended, on the space requirements of human beings, as expressed either in living space per inhabitant or in linear dimensions of rooms. These studies already involve psycho-sociological investigations into the satisfaction of occupants with their dwellings and into the characteristics (area, arrangement and equipment) of more satisfactory housing. Such investigations take the form either of statistical inquiries, the results of which are difficult to apply, or of more thorough inquiries on small samples, or of experimental work mainly designed to confirm the results of the inquiries (demonstration buildings).

5. Some particularly useful studies are being made of housing arrangements for rapidly developing populations.

6. Study of the principal sciences applied in the building industry.

a. Acoustics.
b. Heating.
c. Lighting and colour.
d. Behaviour of buildings in a fire.
e. Hygrothermics.
f. Strength of materials.
g. Use of solar energy; protection against solar radiation.
h. Ventilation (See EKISTICS 9:56, June 1960, pages 417-423).
i. Use of new materials: The main research effort in this field is concerned with certain metals and with plastics. Stainless steel, being now reasonably priced, is used in sanitary fittings, joinery and roofing. Plastics, both thermoplastic and thermosetting, find many applications in the building industry (See EKISTICS 10:59, September 1960, pages 173-186). In three closely related fields--paints, glues and joints--countless experiments are being made with new resins. Glueing, in particular, which is widely used in woodworking, is gaining ground as a highly important technique.
j. Investigation of methods of increasing productivity (mainly through standardization).
k. Preparation and organization of building sites.
l. Research on productive building processes: This may deal with the use of materials which are unconventional and which may be used in a special and highly productive manner, or with new methods of employing materials. Some very significant research is being done on prefabircation. The main subjects of this research follow:
    (1) prefabrication of flooring components;
    (2) prefabrication of large panels of loadbearing walls;
    (3) prefabrication of large non-loadbearing panels for partitions and exterior walls;
    (4) prefabrication of boxes designed for stacking;
    (5) prefabrication of fittings.
m. Prefabrication of industrial buildings.
n. Self-supporting structures; advantageous shapes.

Hockin, Margaret L.
HOUSING AND FAMILY WELL-BEING
Community Development Bulletin. Vol. XI, No. 3, June 1960. Pages 58-63.
322.2 (100)

1. Margaret Hockin, Chief of the Home Economics Branch, Nutrition Division of the FAO, presented this as Part I of a Paper "The Needs and Sources of the Family" read at a Conference on Social Development through the Family, September 1959, at St. Hugh's College, Oxford. Her suggestions as to measures for the improvement of housing and related facilities, abstracted below, are made after a survey of housing conditions, social welfare aspects of housing and community facilities as related to housing.

MEASURES TO IMPROVE HOUSING AND RELATED FACILITIES

2. National and Economic Policies. Among the different ways of introducing the construction of new housing and community facilities within the framework of national and economic policies are measures of a financial or fiscal nature, such as tax concessions, state-guaranteed mortgages, extension of loans, capital subsidies, direct subsidies to householders, and building of rental housing with public funds. While no standard formula for organising national programmes for low-cost housing and related community facilities can or should be accepted, low-cost housing and community facilities require consideration in relation to health as well as to economics and technology. Furthermore, if special programmes exist for community development, urbanisation problems, etc., ways and means of utilising the resources of these programmes for the extension of low-cost housing and community facilities should be devised.

3. Surveys of Housing Conditions. Statistical data are needed on the population and size of families when assessing housing conditions and the extent of the need for low-cost housing units (See EKISTICS 10:58, pp. 128-130).

4. Mobilisation of Individual and Group Efforts. It is useless to attempt to apply conventional western standards to many countries, especially in rural areas. Community effort can hardly hope to do more than assist low-cost housing in towns where the enhancement of land values frequently puts the problem beyond the resources of the working class, and, for the rest, stimulate and enable families to build according to rising standards but often with the materials accessible to them and which they have learned to use. The Illustrated London News recently carried the story of an Assistant District Officer in New Guinea who demonstrated a model hut built in the native way but novel in that it was high enough for the occupants to stand upright inside. The people responded by building a thousand huts like this model.

5. Human resources, however, may remain largely untapped because of lack of incentives, of knowledge and skills, and of funds and organisation. Two major types of

individual effort may be distinguished: self-help in undertaking all or part of the operations involved in preparing the land, producing materials and building the house; and in personal saving with a view to acquiring a home. Self-help of the former type is particularly appropriate in rural communities in developing countries. Lare unused or partially unused labour resources are frequently available as a result of under-employment or seasonal unemployment, and suitable building materials can often be obtained and prepared at little or no financial cost. In urban communities self-help has more limited application and calls for further research and experience. There are also large opportunities for improving housing conditions through group action. In many highly industrialized countries and also in those less industrialized, there is a widespread interest in stimulating personal savings and co-operative housing. There are a great many obstacles, however, chief of which are insufficient co-operative experience, limited management capacities and lack of financial resources.

6. Education and Training. The success of self-help housing largely depends on effective education to explain fully the purpose of the project and how families can share in it, and to arouse their interest and support. There is also a need to develop methods which would diminish reliance on exceptional conditions and exceptional people to carry out self-help, mutual aid and co-operative housing projects. It is difficult, however, to envisage a marked increase of individual and group effort without security of tenure and ownership rights. Self-help in house building may require technical and material aids and training facilities.

7. Seminars on the education of householders might be organised. Since housing and home improvement have a direct bearing on family welfare they should be included in the course of training for welfare workers, home economics and agricultural teachers and extension workers, and community development workers. Such seminars can also serve to emphasis the man's part as a homemaker in modern conditions, and can lead to the teaching of concrete block-making, furniture and mattress-making, and educative work on ventilation, latrines, showers, water-storage, disposal of waste, clean storage of food and other aspects of family living. It can also be associated with the training of needed craftsmen such as carpenters, tinsmiths and potters.

8. The improvement of existing structures may make a contribution as important as new building. Repairs, decoration and termite proofing may be effected, ventilation improved, windows cut and screened, verandas, kitchens and washrooms added, rooms partitioned and sheds built for animals. Such operations have great social value as family projects. They can be carried out not only by adults but can add reality to the work of youth clubs and form a part of home economics and manual arts classes in the schools. The accomplishment of such work may confer new and valuable skills and improve the economic basis of the family.

Higasa, Tadashi

A STUDY OF THE PLANNING UNIT AND THE ORGANIZATION OF FACILITIES OF THE RESIDENTIAL AREA

Report of the Building Research Institute, Ministry of Construction, Japan. No. 32. March 1960. 65 pages. Illustrations. English and Japanese

711.1 (52)

1. Tadashi Higasa, a research member of the Japanese Building Research Institute, presents extensive research on living habits in Japan to support planning for a new "community district" unit larger than the usual concept of the "neighbourhood."

2. The survey of the zones of life in residential areas in larger cities has revealed that the line of movements for shopping is as high in frequency as those for attending offices and schools, and the investigation with regard to the kinds of commercial facilities and their utilization area has made clear their significance in city planning. These and other studies have led to the conclusion that it is proper to regard the walking-distance area which has its center in the commercial core as the zone of everyday life, which is also to be considered as a service unit, and to make it a new planning unit larger than the "neighbourhood unit" system so as to facilitate technical adjustment between housing construction and city planning.

3. Since houses are being constructed in larger cities without any control, it has been recommended that construction of new residential sections be planned in accordance with city planning, that the "community district" be employed as the planning unit in forming residential areas, and that the standards of various facilities proposed in table 4.2 and below be adopted.

a. The "community district" is a planning unit with the walking-distance area as its zone of everyday life which lies within a radius of one kilometer from the district center, and it is considered that the proper population is 50,000-60,000.

b. The community district is generally divided into three subdistricts; central area, green tract, and residential area.

c. The residential area consists of several neighbourhood units which lie surrounding the central area, and the neighbourhood unit has 8,000-10,000 inhabitants and, as it has a primary school in its center, it is the zone of life for school children.

d. The district center is located near the traffic core of the community district where the lines of movements of daily-life are concentrated, and it is constituted of various kinds of public as well as commercial facilities which are closely connected with everyday life of the inhabitants. It is desirable that these facilities be grouped according to their specific functions into several sections, such as traffic, business, culture, etc.

e. A subdistrict center is formed in each neighbourhood unit as a subordinate to the district center.

1) The community district is a planning unit with the walking-distance area as its zone of everyday life which lies within a radius of one kilometer from the district center, and it is considered that the proper population is 50,000 ~ 60,000.

Table 4.2 Proposed Standard for Facilities of Community District

Facilities of Community District

No. of neighbourhoods	1	2	3	4	5	6	
No. of households	2,000 ≀ 2,500	4,000 ≀ 5,000	6,000 ≀ 7,500	8,000 ≀ 10,000	10,000 ≀ 12,000	12,000 ≀ 15,000	In the case of larger district center containing 5~6 neighbourhoods and attracting outside population
Population	8,000 ≀ 10,000	16,000 ≀ 20,000	24,000 ≀ 30,000	32,000 ≀ 40,000	40,000 ≀ 48,000	48,000 ≀ 60,000	
Middle school	—	1	2	2	3	3	
High school	—	—	1	2	2	3	Other school
City hall or ward office (branch)	—	1	1	2	3	4	City hall or ward office
Fire station (branch)	—	1	1	1	2	3	Police station
Post office	—	1	1	2	3	4	Fire station
Hospital	—	1	1	2	2	3	Health center
Community center	—	—	1	1	1	1	
Service station *	—	—	1	1	1	1	
Railway station	1	1	1	1	1	1	
Station square	1	1	1	1	1	1	
District park	—	—	—	—	1	1	
Total no. of shops in community district * *	80~ 100	160~ 200	360~ 450	480~ 600	800~ 1,000	1,000~ 1,200	Small size department store +20% no. of shops
Bank	—	1	2	2	2~3	3~4	
Cinema	—	—	1	2	2~3	3~4	

* Service station for electricity, gas, water and sewage

** No. of shops provided in district center will be changed according to the composition of neighbourhoods.

Facilities of Neighbourhood

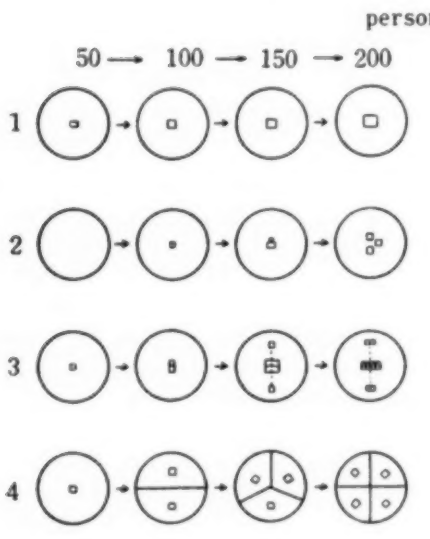
No. of households Population	2,000~ 2,500 8,000~10,000
Primary school	1
Neighbourhood park	1
Swimming pool	1

Facilities of Subdistrict

No. of households Population	1,000~1,200 4,000~4,800	Clinic Assembly hall	1 1
Kindergarten	1	Administration office	1
Children's park	1	Police box	1
Public bathhouse	1	Daily shops	40~50

* Play lot is provided per 100 ~ 200 households.

Fig. 4.3 Change of Service Area of Facilities According to the Increase of Population Density



1. Public facilities of single type (e. g. city hall)
2. Commercial facilities of aggregation type (e. g. movie theatre)
3. Commercial facilities of scattered type (e. g. neighbourhood shop)
4. Public facilities of scattered type (e. g. primary school)
   Commercial facilities of scattered type (e. g. public bathhouse)

Fig. 4.6 Structural Pattern Composed by Community Districts

Urban Renewal Notes
PAINTING THE TOWN
Urban Renewal Notes, July-August 1960.
333.322 (73)

1. This short report is from the first issue of "Urban Renewal Notes" published by the Urban Renewal Administration. It will be a bimonthly digest, or index to experience, pointing a finger at good techniques, reporting unusual local approaches and successes and summarizing pertinent URA program developments and publications. The following is a report of an unusual and successful approach in enhancing the attractiveness of a community.

2. Painting a town or a neighborhood has proved a successful urban renewal tool in a number of small western towns of the USA and appears headed for more widespread use. What is unusual about these paint-ups is that the painting is not just left up to the personal color choices of the property owners. They are done according to a coordinated color plan and are part of a concentrated overall community effort, which not only beautifies the area but brings about a unified community effort.

3. A coordinated color plan is one that provides the harmony of color and architecture that make up the personality of a community. The plan takes advantage of the characteristics of an area--its historical background, terrain, or any one of a dozen factors--to determine a color scheme for the beautification and rehabilitation of the whole town. Colors are chosen which blend, complement, and fit the surroundings, or a new color can be created.

4. Thus was created Weaverville Red, from the predominant color of the soil of this famous old California mining town. Weaverville has a number of fine, historic buildings. Its main street was formerly lined with stately elms. The widening of a state highway required the removal of the trees, exposing old, shabby, unpainted buildings, previously hidden. New trading areas springing up in connection with a nearby dam project threatened the business activity of the town. By taking into account the historic significance of the town and exploiting the unique aspects of the buildings on the main street, a co-ordinated color plan was prepared.

5. Paint-up has spread to other towns. Ten western towns have already successfully boosted their business through the skillful repainting of their main streets; 16 more, in the State of Washington, are now having co-ordinated color plans developed for their central business districts; and Puerto Rico is reworking Old San Juan. The plan need not be confined to the shopping area of a town. Such a color plan is being created for the entire city of Fairbanks, Alaska.

Great Britain Department of Scientific and Industrial Research
MOULD GROWTH ON PAINTS IN THE TROPICS
Overseas Building Notes. No. 67. May 1960. 20 pages.
698 (213)

1. EKISTICS has presented the problem of painting roofs in the tropics in the March 1959 issue (7:40, pp. 163-170). This paper is another of the series prepared by the Tropical Building Research Section on painting.

2. Conditions for Growth of Moulds. The main factor in the ability of spores to germinate and grow is high humidity, usually quoted as not less than 70% and preferably over 80%. Because moulds and algae are small inactive organisms, their food requirements are extremely small. Moulds require, in addition to organically combined carbon, small amounts of nitrogen, phosphorus and sulphur, and traces of potassium, magnesium and iron compounds. These can be obtained from a wide variety of dead animal or vegetable matter including deposits of dusts from the air. Moulds are therefore often found growing on substrates (even glass) which do not appear to be capable of supporting growth; paint films do not necessarily have to be regarded as a source of nutriment, but there is abundant evidence that they can be.

3. Moulds will survive in the range of temperatures from well below freezing point up to about 50°C (122°F); they grow best at 25-30°C (77-86°F), provided the humidity remains high. The apparent tendency to grow in cool situations is a result of such places being damper than the surroundings. Oxygen is essential, but light is not; some moulds are readily killed by ultra-violet light or sunlight, but others are resistant, as evidence by growth on full exposed paintwork.

4. The Prevention and Cure of Moulds and Algae on Paint. Vegetation close to a building is often blamed for mould attacks. The higher local humidity which it creates, rather than direct infection, is probably the reason. Large trees and plants should therefore be kept away from buildings in humid climates; their shade is more usefully employed in dry sunny climates where mould is less likely to be troublesome. Detailing should be simple, to allow easy cleaning and painting. Asbestos-cement sheets painted with emulsion paint may prove more resistant soffits under eaves than wood or hardboard painted with oil or gloss paints. Sun louvres are another source of trouble; the factory-made stove-enamelled metal louvre is much more resistant than painted wood.

5. Algae are likely to occur wherever water flows over or is retained on a surface; this is usually unintentional and only seen after the building is completed. Wide eaves, parapets with the top surface sloping inwards to a properly drained roof, well-raked canopies to prevent splash back on to walls, all help to maintain a clean appearance. The vertical edges of canopies almost invariably become stained if not protected. This can be largely prevented by the use of emulsion paint or disguised by the use of grey

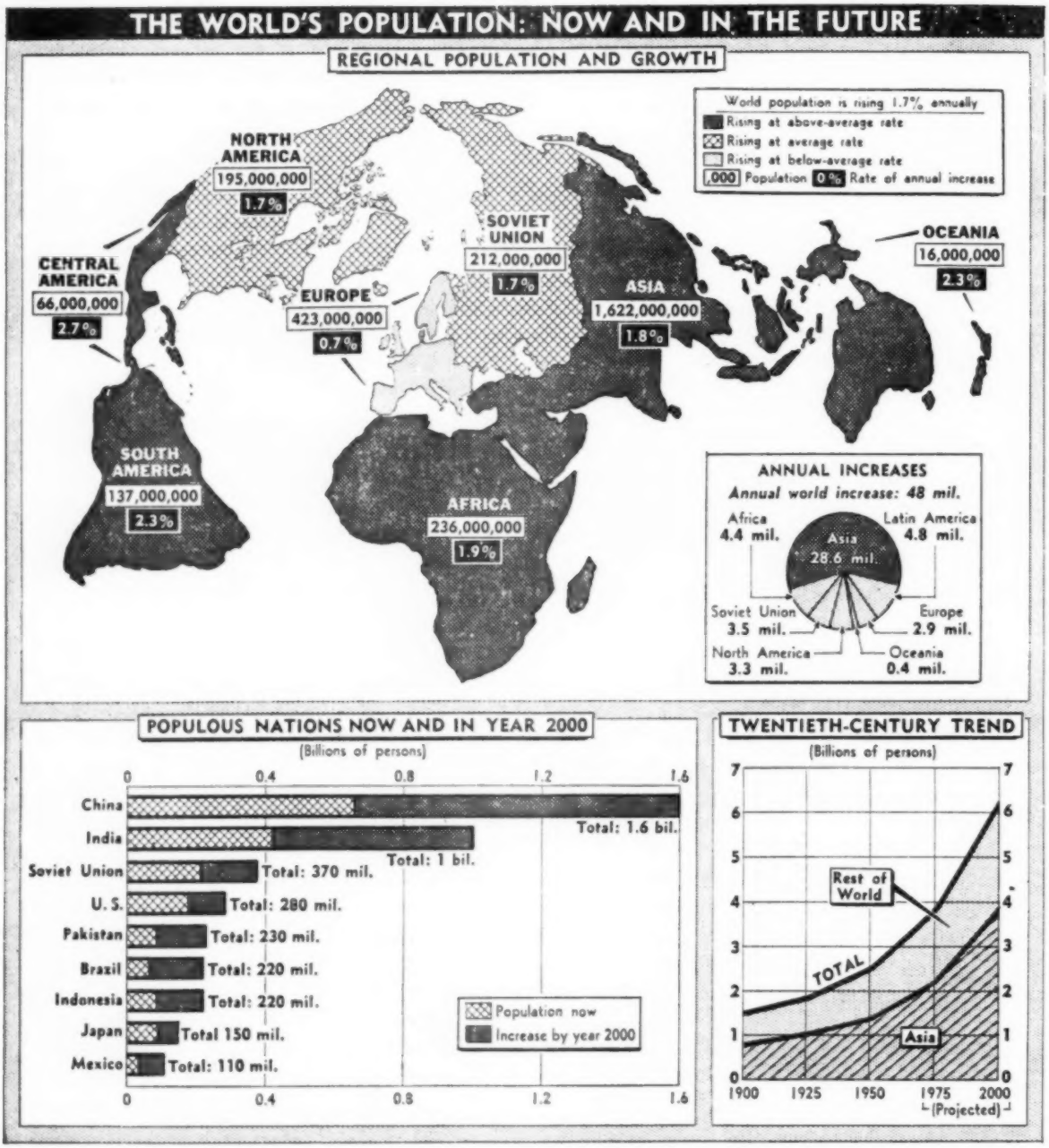
paint. Domed surfaces are very susceptible to algae; the use of an impervious material or paint should be considered. Controlled and adequate outlets for rainwater, provided by correct falls to flat roofs, channels and spouts, should lead water away from surfaces whose appearance is important. Where rainwater pipes are not permitted, an open channel in the wall, painted black with bitumen paint, may provide a tidy solution. Good drainage at the footings, or a pebble surround, prevents splash-back, and with a damp-proof course controls the unsightly results of damp walls near the ground. The increased heat absorption caused by algae growths on roofs merits special attention to methods of prevention. Since the growth occurs however steep the pitch recourse must therefore be made to fungicidal washes or to suitable types of paint.

6. Susceptibility and Resistance of Paints. The pigments in paint may deter or encourage mould growth, or have no effect. The most important of those which deter growth is zinc oxide. Aluminum pigments are also resistant but have obvious limitations in general use. Pigments tending to produce slightly alkaline films (such as calcium carbonate) have been claimed to have a useful influence. Glossy paints may be expected to have better resistance than matt paints by reason of their smoother surface and greater water resistance.

7. Since a fully mould resistant combination of pigments and media is not generally practicable from other aspects of performance, resistance is usually sought by the addition of small amounts of truly fungitoxic compounds to standards types of paint. They include phenol and related substances such as chlorinated phenols and salicylanilide, and a variety of organic compounds of mercury and copper.

8. On weathering, the surface of the film is roughened, which at first may produce a better foothold for spores to remain and grow, against the washing action of rain. Continual chalking, however, has the effect of removing the whole surface layer, and the mould with it. A strongly chalking paint may therefore be useful to avoid mould growth externally. Weathering also causes loss of fungicidal ingredients by leaching, volatilisation and decomposition, so that the initial resistance is speedily reduced. At present, it appears that not much more than a year's life free from mould is being obtained from exterior 'fungicidal' paints although their protective life may be much greater.

9. The cleaning of paintwork often leads to a rapid reappearance of mould growth. It has been suggested that residues of soap or detergent may encourage growth, but the microscopic roughening of the surface is probably the main cause. Application of a fungicide in the form of a solution, may prove beneficial; it is recommended when repainting is necessary.



The United Nations released last week, in its 1959 Demographic Yearbook, its annual survey of world population statistics. The U. N. figures show that, with birth rates steady and death rates falling, population is growing at an increasing rate. The map and charts above illustrate some aspects of the world's population today and in the future.

Hagen, Everett E.

TURNING PARAMETERS INTO VARIABLES IN THE THEORY OF ECONOMIC GROWTH

Papers and Proceedings of the Seventy-second Annual Meeting of the American Economic Association, Washington, D.C., December 28-30, 1959. American Economic Review, Vol. L, Number 2, May 1960. Pages 623-628.

33 (100)

1. This is the first of a group of papers presented at the 72nd annual meeting of the American Economic Association on economic development. General articles on economic development abstracted in EKISTICS within the last year are:

The Inter-action of Economic and Social Factors in Economic Development. EKISTICS 8:49, November 1959, pages 378-381.

External Assistance and Development Programmes. EKISTICS 8:49, November 1959, pages 368-370.

Central Government Organization for Economic Planning and Development. EKISTICS 8:49, November 1959, pages 371-374.

Aided Self-Help or Cooperation? EKISTICS 9:55, May 1960, pages 335-342.

Programming Techniques for Economic Development with Special Reference to Asia and the Far East. EKISTICS 9:56, June 1960, pages 464-466.

Problems Concerning Techniques of Development Programming in African Countries. EKISTICS 9:56, June 1960, pages 458-463.

2. It is not new or original for economists today to recognize the influence of non-economic factors on behavior. These non-economic motivations in general are not analyzed by economists. Rather, since they can be assumed to remain constant, they are treated as parameters, are explained on an ad hoc basis or not at all, and then further analysis is in terms of economic theory. This procedure is more or less adequate in many areas. But when one turns to the problem of explaining why and how a society with stationary or virtually stationary technology makes the transition to continuing technological progress, this procedure becomes inadequate. Non-economic factors must enter fully into the theoretical system as variables, with causal relationships flowing to as well as from them.

3. As among Indonesia, India, China, and Japan, during the past four hundred years the country with the greatest degree of contact with the developing west was Indonesia, where the Dutch were securely ensconced for three hundred years. The one with the

next most contact was India, under the English; and the third, China, where many trading and other enclaves along the coast brought considerable contact. Japan clearly had the least contact of all. Further, of the four, the country with the poorest resource availability was Japan. Yet of the four, Japan began economic growth first and has made by far the most progess. Among the others China is most clearly on the road of continuing technological progress and rising income; India has now probably begun the process; and Indonesia is at the end of the procession. This is precisely the reverse order of the degree of opportunity for contact with advanced techniques. These are important cases; it is utterly impossible to explain the relationships among them on economic grounds.

4. In addition, the purely economic theories of why technological progress does or does not occur do not seem to stand up empirically. For example, saving is low in most technologically static societies. It is asserted that this is because income is too low to permit saving, and hence that a vicious circle is created. But as we get more income data about low-income countries we find that even at incomes of $50 or $100 per capita, they can save adequately to achieve economic progress, if they are sufficiently motivated to do so. A second example suggests that because low-income markets are so small, there is no inducement to invest. But, while there is no inducement to establish an aluminum refinery or a light-bulb factory, even in very small low-income countries there are markets for textiles, milled rice and flour, sugar, sandals, and many other everyday items which demonstrably are ample in size to justify investment in improved methods of producing these. And so on for other purely economic theories.

5. The Problems a Relevant Model for Development Must Attack. First, contrary to popular belief, present underdeveloped countries cannot simply imitate our methods. Technological progress requires creativity in presently underdeveloped countries just as it did in the first industrial revolution. The creative man has a special type of personality and there is some reason to believe that creative men do not exist in a society in equal numbers at all times, just waiting, so to speak, to pounce upon economic opportunity when it appears, but rather that one of the factors conducive to the appearance of technological progress is at least a moderate increase in the number of creative individuals in the society, and in the level of their creativity.

6. But it is to be noted that in countries which have entered upon economic growth, unusually creative persons, with changed values, have not appeared at random throughout the society. Rather, they have been clustered in some social group or groups. It is therefore necessary to have a theory about the relationships among social groups in a society, and one which explains how a change in those relationships may occur, which can cause a change in the home environment in some one group that will tend over a generation, or a few generations, to produce unusually creative individuals with changed values.

7. Finally, it is not in the least inevitable that creative and rebellious persons should turn to technology. During many ages, in many countries, they have in the main turned elsewhere, and at any time some such individuals channel their energies elsewhere. It is necessary to evolve a theory which explains how at some times a burst of creative and restless energy in a society gets channeled into technology, and how this comes to be valued highly. Economic circumstances, of course, affect this process and have their place in the model along with other factors.

8. I would like to tell you something about the substance of the model I have evolved, but let me say merely that the forces for stability residing in the functional relationships are such that exogenous economic changes alone will hardly stimulate a transition from traditional society to continuing economic growth. Given certain coefficients, a more or less random initial advance in technical knowledge may have a cumulative effect over a very long time that will do so. Much more interesting are certain changes in the social structure which will stimulate a socially rebellious group to new values, creativity, and, in certain circumstances, economic growth. The model requires a conjunction of circumstances to produce economic growth. The requirements are not highly exacting. Over quite a range of variation of the relevant values, if you give the model a nudge at some time in its history, economic growth will be the outcome.

9. The model matches and "explains" in my judgment major elements in the transition to economic growth in England, in Russia, in Japan, in Colombia, and perhaps elsewhere when other cases have been explored; and also explains major elements in the failure of growth to occur in a number of other societies. I hope that it has some predictive value. Whether or not this optimistic assessment of its usefulness proves to be correct, I am convinced that only such an interdisciplinary model can give us an understanding for the transition to economic growth adequate for analytical purposes.

Nicholls, William H.
RESEARCH ON AGRICULTURE AND ECONOMIC DEVELOPMENT
Papers and Proceedings of the Seventy-second Annual Meeting of the American Economic Association, Washington, D.C., December 28-30, 1959. American Economic Review, Vol. L., Number 2, May 1960. Pages 620-635.
33: 63 (100) (73)

1. William H. Nicholls of Vanderbilt University, Nashville, Tennessee, writes on the relation of agriculture and economic development. His experience is primarily related to southern United States where he is located which is relatively underdeveloped. The article on the TVA provides a specific example of a planned regional development (See pages 253-259)

2. Problems of Underdeveloped Countries. Insofar as general economists have concerned themselves with the problem at all, their approach has usually been too global to throw much light on the role of agriculture in economic development. The general economists of both advanced and underdeveloped countries have usually been abysmally ignorant of agriculture and village life. Hence the validity of their analyses has frequently turned on their assumptions as to fact--for example, the extent of disguised unemployment in rural areas and the potentialities of increasing food output with given supplies of land and labor, about which far too little is as yet known. They have also tended to deal in such abstract agglomerates as capital without regard for the fact that, within agriculture, the expansion of certain minor components of the aggregate capital might, by supplementing the supplies of particular limitational factors, have very low incremental capital-output ratios. As a consequence, particularly for overpopulated countries with a clear and present danger of food shortage, the policy implications of their analyses often tread on perilous ground.

3. The plain fact is that the complementary studies of the technological, economic, and socio-psychological relationships within the dominant agricultural sector of underdeveloped countries have been woefully few. This deplorable dearth of basic knowledge about agriculture reflects the extreme shortage of well-trained indigenous agriculture specialists both economic and technical in such countries. It also reflects the failure to date of Western agricultural specialists to devote more of their research resources to specialized studies of foreign agriculture and the thus far peripheral interest of the American land-grant college system in institutionalizing such foreign oriented research as a normal and vital part of its research activities. Until we have a substantial increase in both the quantity and quality of micro-economic and specialized technical research on the problems of the world's low productivity agriculture, micro-economic analysis must continue to rest upon a very speculative and shaky base.

4. Problems of Underdeveloped Regions. Meanwhile, at least some solid research progress has been made in recent years on the regional aspects of agriculture and

economic development--notably in southern Italy, in northeast Brazil, and in the southern United States. I shall conclude with a brief summary of the objectives, methods, and findings of a large-scale research project on Southern Economic Development and Agriculture which has been under way at Vanderbilt University since 1952. The most impressive product to date of this is Professor Anthony M. Tang's book, Economic Development in the Southern Piedmont, 1860-1950. My own efforts have thus far produced a series of journal articles reporting on the findings of my parallel study of the Upper East Tennessee Valley.

5. While our approaches have differed in detail both of us has sought to test a series of sub-hypotheses which may be grouped:

   a. that the labor, capital, and product markets facing agriculture are relatively more efficient in local areas which have enjoyed considerable industrial-urban development than in similar nearby areas which have not;

   b. that the effects of such different rates of industrial-urban development have accordingly been increasingly wide interarea differences in per-worker agricultural capital and farm output (income); and

   c. that fundamental impediments to equilibrating factor movements exist, tending to perpetuate differences in market efficiency and agricultural productivity between the more and less industrial areas.

6. Our findings may be summarized as follows:

   a. Within each area, today's more industrial counties had in 1850-60 an agriculture with certain significant advantages over the agriculture of today's less industrialized counties. Among these advantages were superior "original" agricultural land, certain differential windfall gains from new cash crops, and higher rates of capital formation in agriculture. Under conditions of perfect factor immobility, such original differences might have sufficed to account for today's wide income differentials. During the pre-industrial years 1860-1900 however these earlier intercounty differences virtually disappeared. Our analyses thus indicate that there were sufficient factor (particularly labor) transfers to eliminate those income differences attributable to differences in original physical endowment.

   b. In 1900, today's more industrial counties did not have significantly different levels of farm capital per worker or farm output per worker from today's less industrial counties. By 1940, however, today's

more industrial counties had not only experienced differentially high rates of industrial-urban development but their agriculture also clearly enjoyed superior capital-labor ratios and higher farm-labor productivity. Although equilibrating factor transfers had meanwhile continued at substantial levels, these were obviously insufficient to prevent an increasing divergence in farm incomes and productivity within each area. Instead, our analyses strongly support the view that local industrial-urban development made an important positive contribution to the efficiency of the local factor and product markets; thereby greatly facilitating the transfer of excess labor out of agriculture and of needed capital into agriculture within the immediate environs of the growing industrial center. Counties lacking such dynamic conditions of industiral-urban development were unable to hold their own through out-migration alone, even though such labor transfers had once sufficed to overcome income differences attributable only to original resource endowments.

c. The period 1940-54 permits the acid test for our conclusion that local areas cannot, in the absence of the industrial-urban development enjoyed by neighboring areas, overcome their differential disadvantage in farm incomes and productivity through out-migration alone.

7. While our research at Vanderbilt has been applied to relatively small, homogeneous areas, I believe that its policy implications have considerable relevance to the problems of much larger underdeveloped regions or countries. First, industrial-urban development offers the major hope for solving the problem of low agricultural productivity, once prior problems of an inadequate food supply have been met. Second, insofar as not inconsistent with fundamental economies of location and scale, the more widely dispersed such industrial-urban development, the more generally can agricultural productivity be increased. Finally, particularly for those areas which lack the attributes required for sound industrialization, public policy must provide for facilitating farm-labor and farm-capital mobility at rates far in excess of those which can be expected under complete laissez faire.

Mason, Edward S.
THE ROLE OF GOVERNMENT IN ECONOMIC DEVELOPMENT
Papers and Proceedings of the Seventy-second Annual Meeting of the American Economic Association, Washington, D.C., December 28-30, 1959. American Economic Review, Vol. L., Number 2, May 1960. Pages 636-641.
33 (100)

1. Edward S. Mason of Harvard University outlines three situations in which the role of government varies in its relationship to economic development. These are (1) in stable social structures, (2) in a society in process of drastic change, and (3) physical environment and resources of the society.

2. The changing role of government over time within a relatively stable social structure and culture, e.g., Western Europe and the areas of European settlement, since the beginnings of industrialization. To choose such an area and period implies at least two things: (1) that it is fruitful to examine the similarities and interrelationships among the countries that make up this culture as well as the special circumstances of a particular country; and (2) it means that despite a continuous process of change over roughly two centuries it is still useful to think of this as development within substantially the same society.

3. If we look back to the beginnings of industrialization in the West, particularly in England, we can hardly fail to be struck by the smallness of the positive role played by government in the development process. Apart from maintaining law and order, adapting the legal framework to meet the conditions of enterprise, and providing a minimum of social and economic overhead, the main contribution of government was to get out of the way. In the United States, government's role was larger but the initiative did not come principally from Washington or the various state capitals but from private groups who needed public action to further their own economic interests or to the interests of their areas. The prime mover of economic change was private enterprise, and, indeed, at this stage of development it is difficult to see how it could have been otherwise. Whatever the merits of public administration, it is not well adapted to the process of woodshed invention, trial and error experimentation, and risky decision making that characterized the early stages of the industrial revolution.

4. On the Continent, where industrialization came later than in England and where the philosophy of natural liberty never cut quite so wide a swath, the role of the state in economic development was much larger. Gerschenkron, in an essay that has become a classic in this field not very well supplied as yet with classics, relates an increasing role of the state to the degree of backwardness found in the society in which the growth process is being initiated. Backwardness can accentuate the role of government in at least two ways. By influencing the goals of the society and the motivations of its political leaders in ways that can only be realized by public action, backwardness can

shift the onus of development to government. But late-comers are also impelled along this route because government can play a role in the transfer of established technology and forms of organization that it could never have played in their initiation. This was true in the later development of Western European countries and it has particular relevance in the currently underdeveloped world.

5. The role of government in a society in process of drastic change. Obviously societies are always in process of change but it does not do violence to the facts to differentiate a period and an area such as Western Europe in the nineteenth century from the current situation in much of the underdeveloped world with respect to actual and potential rates of change. Marx has given us a model for the study of revolutionary change in which the transfer of political power from one group to another represents, on the one hand, the final stage of disintegration of an old society and, on the other, the first step in the integration of a new. But the Marxian model tells us that in reality the new society has already been shaped within the womb of the old. Although the role of the state, during the period of the "dictatorship of the proletariat," in bringing into being the institutions of the new society, is an important one, essentially the institutions, values, and motivations of the new society are predestined by the course of development of the old. Government in effect sets its seal upon that which social change has produced. In classical Marxism, government is revolutionary, as well as evolutionary, periods of history is very much the shaped rather than the shaper of the course of events.

6. This model, whatever its applicability to other historical situations, does not seem to fit the facts of the Soviet and Chinese revolutions nor may it have much relevance to the course of development in southern Asia and Africa. Although in the Soviet Union and China the process of disintegration in the old societies had proceeded far and the ground was well prepared for a transfer of power, there was little evidence of the appearance of an alternative "mode of production" around which the institutions of the new society could be organized. To bring these institutions into being and to shape the new society has been in fact, in the Soviet Union and China, the task of governments holding, in Lenin's phrase, a "monopoly of violence," equipped with a well-developed ideology, and availing themselves of all the instruments of authority and terror.

7. The Soviet and Chinese examples at least raise the question, in the traditionalist societies of southern Asia and Africa, whether governments appropriately equipped with development aims and a development ideology, able to draw on the technology of more advanced areas, and not lacking in the instruments of authority, may not go very far in reshaping their own societies. Clearly these governments to be successful will have to command a measure of popular support and obviously their sphere of action is limited by the characteristics of the society of which they are a part. But the ratio of the politically inert to the politically active elements in these societies is so large that the necessary support may come from a relatively small element of the population. And, as the experience in a number of southern Asian and African countries has already indicated, governments in these newly independent states are not likely to limit themselves very long to an observance of the trappings of democracy.

8. Elements in the physical environment that will influence the reciprocal relations of state and society. It has, for example, been observed that the size of an economy, by various measures, is related to its degree of dependence on international trade. In the competition for export markets, government has some notable disadvantages compared to private enterprise. It may be that a high degree of dependence on foreign trade may not be compatible with an effective government control of the direction of resource use.

9. The size of an area of potential settlement in relation to the available human resources also conditions the relation of public to private enterprise. In early American development, both state and federal governments were called upon to undertake tasks that by reason of the size of the area and the sparseness of the population were beyond the capabilities of private enterprise. The very sizable fraction of total investment that in various Latin American countries falls in the public sector is influenced by these physical considerations. No doubt there are many other aspects of the physical environment and of the relation of human to physical resources that deserve attention in an inquiry into the role of government and economic development. But let me conclude by repeating the statement with which this discussion began: The critical question that must guide such an inquiry is the extent to which government can shape, or is inevitably shaped, by the society of which it is a part.

Hirschman, Albert O.
RESEARCH ON ECONOMIC DEVELOPMENT--DISCUSSION
Papers and Proceedings of the Seventy-second Annual Meeting of the American Economic Association, Washington, D. C., December 28-30, 1959. American Economic Review, Vol. L., Number 2, May 1960. Pages 654-656.
33 (100)

1. Albert Hirschman sums up and relates the various papers on economic development presented at this meeting of the American Economic Association. In addition to the 3 papers abstracted on the preceding pages of EKISTICS, the following were presented at the meeting: "The Factor Proportions Problem in Underdeveloped Areas" by Richard S. Eckaus; and "Interindustry Research in Economic Development" by Hollis B. Chenery. We report his comments on the three we have abstracted.

2. It is probably significant for the state of our concern with economic development that the session dealt, not with concrete issues in developing theory and policy, but with the kind of research that is presently being undertaken with the aim of probing into some of these issues. This is encouraging evidence that, while the stage of self-sustained growth may yet be some way off for many of the underdeveloped countries, the economics of development has firmly entered the era of foundation-supported maturity and prosperity. In fact, the papers presented here read somewhat like progress reports submitted to a foundation and requesting an extension of the original grant for two more years. In such situations, since the research that is being described has not yet been concluded, the authors are precluded by their scientific standards from telling you in advance the conclusions they are going to reach. It is no easy task, then, to discuss papers which hardly provide one with targets for agreement or criticism. I suppose the best I can do is to appraise the importance of the questions that are being asked.

3. Among our speakers, Professor Hagen has set himself the most ambitious task; namely, the elucidation of the causa causans of economic development which he identifies as a non-economic phenomenon. My doubts about his procedure can be summarized in two points. In the first place, with his accent wholly on creativity, intergroup tension, and rebellion, he underrates in my opinion the importance of what I have called the "co-operative component of entrepreneurship." I should like to refer him to recent research of Banfield and Silcock which shows, respectively, that backwardness may be rooted in the inability to co-operate rather than in the unwillingness to disagree and that development can be held back by an excess rather than a deficiency of aggressive entrepreneurship. Second, I am skeptical of the thesis that economic development depends rigidly on the prior coming into existence of certain "values, needs, and world view" among a subgroup of the to-be-developed society. I have wondered whether Hagen is giving enough attention to the possibility that in some countries the characteristics which he considers as primordial have not

rather been induced by economic development itself. In any event, the peculiar difficulties which accompany economic development in many underdeveloped countries today are largely grounded in their insistence on undertaking development before any one set of preconditions has been realized; and interdisciplinary thinking and research can perhaps help us in perceiving how the peculiar path that development is likely to take depends on which values are duly present at the start of the process and which ones will have to be generated by the process itself.

4. For me, the most interesting part of Professor Nicholls paper is the demonstration that industrial-urban development is the most potent contributor to agricultural progress. In view of his conclusive findings on this score, I wonder whether he is not unnecessarily constructing a vicious circle of his own by maintaining that the problems of inadequate food supply have to be met first. I am also a little worried about possible generalizations which others might draw from his and Tang's findings on the lack of interregional transmission of growth. It must be kept in mind that within the fairly small homogenous area studied by Nicholls and Tang, the polarization effects are bound to be more powerful than between two countries; and attempts to interfere with, and to reverse, these effects through fiscal or other public policies are much less likely to be pursued energetically and successfully.

5. Here we are approaching Professor Mason's territory: the role of government. His hypothesis that the speed and intensity of change has something to do with the extent of the role of government is plausible and consonant with contemporary experience; but I am not sure that it is entirely satisfactory. History provides us with many examples of perfectly static societies where government was virtually totalitarian. On the other hand, the industrial revolution in England was a period of rapid change and simultaneously declining role of the state. In accounting for the latter fact, Professor Mason adumbrates another possible, and I believe quite interesting, hypothesis: The powers of the state tend to be restricted when society's principal task is experimentation and discovery of the unknown; they are strongest when society's real or imagined task is organization for, and achievement of, a predetermined target.

Clarenbach, Fred A.
CEYLON'S TEN-YEAR PLAN AND PROSPECTS
Land Economics, Volume XXXVI, Number 2, May 1960. Pages 188-194.
711.2: 33 (540)

1. In the August issue a review of town planning aspects of Ceylon's Ten Year Plan was published in EKISTICS. This critical article on the plan was written by a Professor of Political Science at the University of Wisconsin who was assigned as a consultant for the National Planning Council, Government of Ceylon by the Food and Agricultural Organization of the United Nations during 1957-58. He bases his analysis of Ceylon's situation on a review of the Ten-Year Plan as well as the following:

> Papers by Visiting Economists. By J. R. Hicks, Nicholas Kaldor, Joan Robinson, Oskar Lange, John Kenneth Galbraith, Ursula K. Hicks, and Gunnar Myrdal. Colombo, Ceylon: The Government Press, 1959, pp. 123. Rs. 4.45.
>
> Population Projections for Ceylon, 1956-1981. By S. Selvaratnam. A report prepared at the Demographic Training and Research Centre, Bombay, at the request of the Planning Secretariat. Colombo, Ceylon: The Government Press, 1959, pp. 57.
>
> Pioneer Peasant Colonization in Ceylon, A Study in Asian Agrarian Problems. by B. H. Farmer. London: Oxford University Press, 1957, pp. 387. 55s.

2. To devise a development plan for a poor and under-enterprising island country with a dense and rapidly rising population almost inevitably requires a great deal of faith, hope and foreign aid. These elements are abundantly evident in the "comprehensive Plan for development for the Ceylon economy covering both the public and the private sectors for the years 1959-68." Equally evident is the high level of professional competence of the Ceylonese who were primarily responsible for this work. The "balanced and co-ordinated whole" is a fairly ambitious plan which, if successfully carried out, would increase national income (1968 over 1957) by 88 percent and per capita income by 36 percent. Total consumption would rise by 62 percent, but per capita consumption would go up only 17 percent in the face of expected population growth during the 11-year period. Thus, even on an optimistic projection for Ceylon, the gap between this have-not country and the prosperous West seems likely to be widened during the "golden sixties."

3. Indeed, some of the distinguished foreign economists who visited Ceylon as advisers during 1957-59 are notably less sanguine about the island's prospects. J. R. Hicks insists that the primary and pressing question is not how to raise living standards.

The problem is, he says: "how to bring about an expansion of employment, on the large scale that is in question, while maintaining, so far as possible, the general standard of living of the Ceylon people in the process."

4. One of the best features of the Plan document is its firm emphasis on the virtual barrier to significant economic improvement that is posed by the rapid increase in population. In the opening chapter two sections of a dozen pages are devoted to the subject. "It is clear," says the Report, "that unless there is some prospect of a slowing down in the rate of population growth and of relative stability, in at least the long run, it is difficult to envisage substantial benefits from planning and development." After noting the fact that conscious decision to limit births has elsewhere played a crucial part in the reduction of family size, the Planning Council suggests that "the whole question of population policy in all its aspects be made the subject of nationwide discussion perhaps through the medium of a competent Committee of Inquiry." The Council emphasized its view that family planning is not a substitute for economic development but is properly "an integral element of a broad policy designed to raise the standard of living of the people by means of the planned development of the national economy."

5. Into what productive activities might Ceylon's rapidly expanding workforce be absorbed? The Island's actual and known potential natural resource base is small in relation to present and prospective population. Deposits of important minerals and mineral fuels are absent or unknown. All petroleum, iron and steel, and other metals for industry must be imported. Of the country's 25,000 square miles, 70 percent make up the Dry Zone. Much of the Dry Zone land is of poor quality and large potentially irrigible areas could be brought into production only at exceedingly high cost. The great seasonal variations in rainfall and streamflow and the scarcity of good sites for necessary large and costly reservoirs naturally mean that Ceylon's water resource potential is economically much less significant than it is often imagined to be. Moreover, the basic water use and management requirements for irrigation, flood control, and hydroelectric power production are frequently, if not typically, more conflicting than complementary.

6. The country's poverty of natural resources suggests that its planners have been assigned the task of making bricks almost without straw. Where can truly productive employment be arranged, and fast, for an additional million or two workers on an island with little space for promising extension of agriculture and so lacking in materials and power for industry?

7. The Plan's answer, in terms of distribution of the additional workforce of 1.3 millions projected for 1968, is to give "maximum practicable emphasis" to industrialization and yet to recognize that "it is inevitable that the main sources of additional employment over the next ten years would continue to be in agricultural and the service occupations." Industry and construction are each assigned

about one-sixth of the increased manpower, public administration 8 percent, other services 26 percent, tea estates 10 percent, and other agriculture 20 percent.

8. The idea of progressive industrialization is nevertheless the "cornerstone" of strategy for long-term development. The broad conception involves an expanding use of foreign exchange (derived from increased exports and reduced imports of agricultural products and from loans and gifts) to buy abroad the capital goods needed for industrialization. The larger items of new capital investment (1959-68) for the "planned sector" of industry would be for cement plants, fertilizer production, sugar processing factories, and facilities for cotton spinning and weaving, while considerably small investments are listed for various other industries of the planned sector. In addition, a sixth of this gross sum is recommended for capital investment in small-scale and cottage industries.

9. The heavy investment requirements for housing, health, education, and transport and communication facilities (40 percent of the 10-year total) are of course primarily reflections of the high rate of population growth. The large allocations to the agricultural sector reflect the need to increase production of export crops in order to get foreign exchange to buy industrial capital goods. They reflect also the pressing need to improve non-export agriculture in already-developed areas in order to feed the growing numbers of people while reducing the large volume of imports of foodstuffs. Finally, they reflect the inevitable pressures for extremely costly projects for irrigation and land development in the Dry Zone.

10. The real doubt about agricultural expansion as a contributor to industrial development concerns its potential for "saving imports" of rice and other foodstuffs. Independently the reviewer reached a concurring opinion with B. H. Farmer, an eminent Cambridge geographer, that the rice account could not realistically be expected to promise "import savings." To the contrary, larger and larger absolute amounts of foreign exchange are likely to be needed to import rice to feed the multiplying numbers of hungry people.

11. Exaggeration of potentials and prospective speed of accomplishment is of course not a monopoly of any one country. Judicious hyperbole may indeed have a most salutary result for national morale. But injudicious magnification of output expectations in a seriously contrived economic plan can render the entire scheme vulnerable and may deeply vitiate its integrity as a guide for development.

12. Ceylon needs desperately to buy time for minimal cultural changes essential for broad and healthy economic growth. Instead, she and assorted foreign friends are allowing her grace period for attacking the demographic problem to slip away.

Gray, A. J. and Roterus, Victor
THE TENNESSEE RIVER VALLEY: A CASE STUDY
Office of International Housing, Office of the Administrator, Housing and Home Finance Agency, Washington 25, D.C. Printed pamphlet. 15 pages. Illustrations
711.2: 711.3 (73)

1. This pamphlet was presented at the 1960 World Planning and Housing Congress, held in the Commonwealth of Puerto Rico as a case study of one of its themes, "The Contribution of Physical Planning to Social and Economic Development." The pamphlet is based on the paper presented at the Congress by A. J. Gray, Chief Community Planner, Government Research Branch, Tennessee Valley Authority and Victor Roterus, Director, Office of Area Development, U.S. Department of Commerce.

2. Introduction. This case study of the Tennessee River Valley has been selected because it represents an advance in planning in the United States, although not all of the river systems of the U.S. have been developed with the idea of maximizing the many potential benefits that can be derived from the planning of a river system as a single entity. However, this case example indicates that modern day planning not only is oriented to economic and social benefits, but involves concepts and techniques beyond mere physical design. The Tennessee Valley illustrates the critical importance of cooperative participation in regional planning by all affected levels of government and private industry and the need for supplementing resource planning by planning in related fields of activity such as health.

3. The drainage basin of the Tennessee River contains the most fully developed and regulated river system in the world. The river improvement system was designed, constructed, and is now operated by the Tennessee Valley Authority (TVA), a government corporation created by Congress in 1933. The basic legislative act directs TVA to improve the Tennessee River for purposes of navigation, flood control, and power; to fit the government-owned chemical plant facilities at Muscle Shoals into the needs of national defense as well as the agricultural needs of the region; and to cooperate with states and localities in studies and surveys for the "purpose of fostering an orderly and proper physical, economic and social development" of the Tennessee Basin and adjoining territory.

4. Two basic ideas underlie the legislation that created the agency as well as the manner in which it has carried out its responsibilities:

(a) the concept of unified river improvement and

(b) the concept of relating river improvements to the development of the region.

THE CONCEPT OF RELATING RIVER IMPROVEMENT TO THE DEVELOPMENT OF THE REGION

5. The drainage basin of the Tennessee River has diverse physical, social and economic characteristics, and through careful planning it was possible to extend the beneficial effects of the river improvements beyond those related directly to navigation, flood control, and power. The basin contains approximately 41,000 square miles and includes parts of seven states. It is an area of heavy rainfall, with average precipitation of about 50 inches per year. Over half the Valley is forested.

6. In 1930 the Tennessee Valley was a rural and agricultural area. More than half of its nearly three million people lived on farms, and less than a quarter lived within incorporated cities. By 1957 the population had grown to 3.6 million, but only 30 percent lived on farms. The remaining 70 percent were nonfarm people largely concentrated in and around the growing cities of the region.

7. Organizing for Regional Planning. In the United States every level of government--Federal, state, and local--has a responsibility for regional development. Although TVA was authorized to undertake surveys and make general plans for the purpose of aiding in the orderly economic and social development of the Tennessee Basin and adjoining territory, the basic problem was to find ways to work constructively with the state, country, and community agencies with which TVA shared responsibility for the development of the area.

8. In order to make its planning activities effective and to relate them to this basic principle of joint responsibility, TVA discarded the idea of a single regional plan developed by one central agency. TVA encouraged the development of planning activities in cooperation with scores of agencies and institutions in the region.

9. The remainder of this paper discusses specific examples of physical planning, as it affected urban and industrial areas, recreation, flood damage prevention, environmental sanitation, and fisheries and wild life, all of which have been conducted within a cooperative regional planning framework. Other important parts of the total regional program, such as forestry, agriculture, power transmission and distribution, and small watersheds, are not covered by this paper.

10. Urban and Industrial Areas. Because some cities located on the river were partially flooded by the new reservoirs, changes were required in the location of buildings, streets, and utilities. In some instances reservoirs flooded parts of trade areas of towns causing changes in the economic base of those localities. But the reservoirs also created waterfront land in and near many cities and provided new and realizable opportunities for commerce, manufacturing, and recreation. In addition, abundant low-cost power stimulated industry, giving new opportunities to use local resources and to provide employment. Development of new industries, improvement in agricultural and forestry practices, and

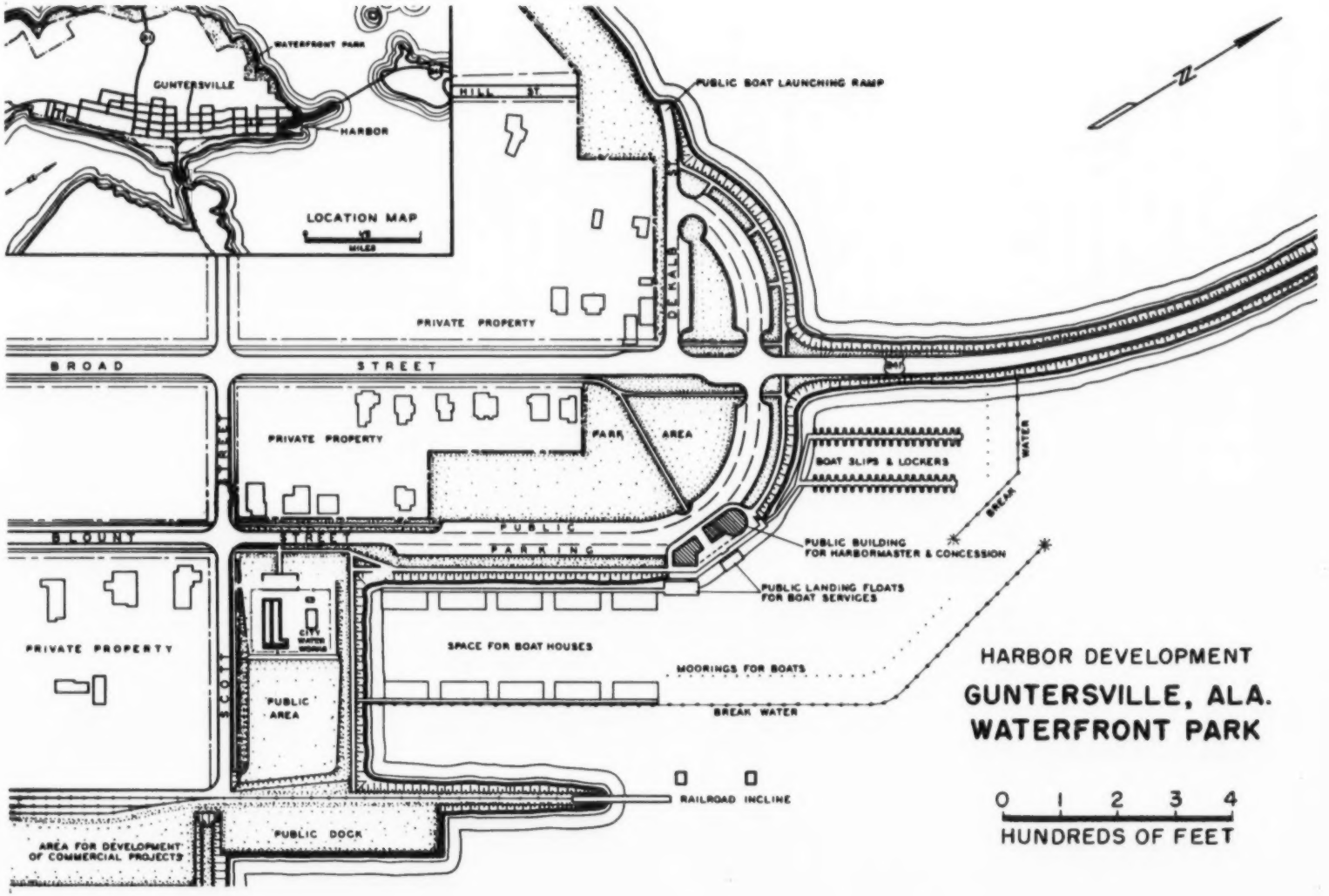


FIGURE 3.--Waterfront park and harbor at Guntersville, Alabama. The small insert map shows the industrial embayment to the east and the recreation embayment to the west of the Guntersville Peninsula. The boat harbor at the northern tip of the peninsula now is home port for pleasure craft valued at over $800,000.

growth of new tourist and recreation business increased income and purchasing power and expanded needs for urban services and facilities.

11. TVA entered into agreements with state planning agencies to give technical assistance to local communities in planning and development matters. Under these agreements the state planning agencies recognized their responsibility to stimulate and encourage planning in communities and counties, to provide technical planning assistance to reservoir-affected communities, and to make the results of studies known to cities throughout the states. TVA also agreed to reimburse the states for technical services to those communities directly affected by reservoir construction and, where possible, to make additional technical personnel available from its own staff when requested by the state planning agencies.

12. In the acquisition of land for reservoirs TVA bought some property above reservoir level. As the reservoirs were filled, there was an immediate demand for sites for all kinds of recreation activity: residential and vacation subdivisions, commercial boat operations, group camps, and private clubs. In contrast, demand for industrial waterfront land was small, although it may develop slowly over the years. Frequently prime industrial land--land on deep water with suitable terrain and easy access to rail and highway transportation as well as to housing and other community facilities--was included within the areas for which there was an immediate recreational demand.

13. To meet this situation, TVA and state and local planning agencies systematically studied reservoir land to determine their potentiality for recreation, industrial, river terminal, and other uses and how these uses might be related to detailed community plans. The general agreements on land use which resulted became the basis for TVA land use control over the limited shore line property which it owned and for community control over abutting private properties through the exercise of zoning and subdivision standards, and in some cases through outright acquisition. This kind of joint effort is illustrated by the planning program at Guntersville, Alabama (See Figure 3).

14. Prior to the construction of a dam 10 miles below the town, Guntersville was a rural trading center of about 3,000 population. As construction began on the dam, TVA suggested that the city create its own planning agency to study effects of the reservoir on the town and to recommend steps the town might take to adjust to its new situation. Initial studies estimated a possible 20 to 30 percent decline in town income due to the flooding of farm land within the trade area. Industries on the new waterway and the development of recreation areas seemed to offer possibilities to compensate for this loss of income. Careful planning of the town's physical structure was necessary to take advantage of these new opportunities.

15. A general community plan was prepared designating the deeper and navigable embayment east of the town for commerce and industry and the shallower embayment

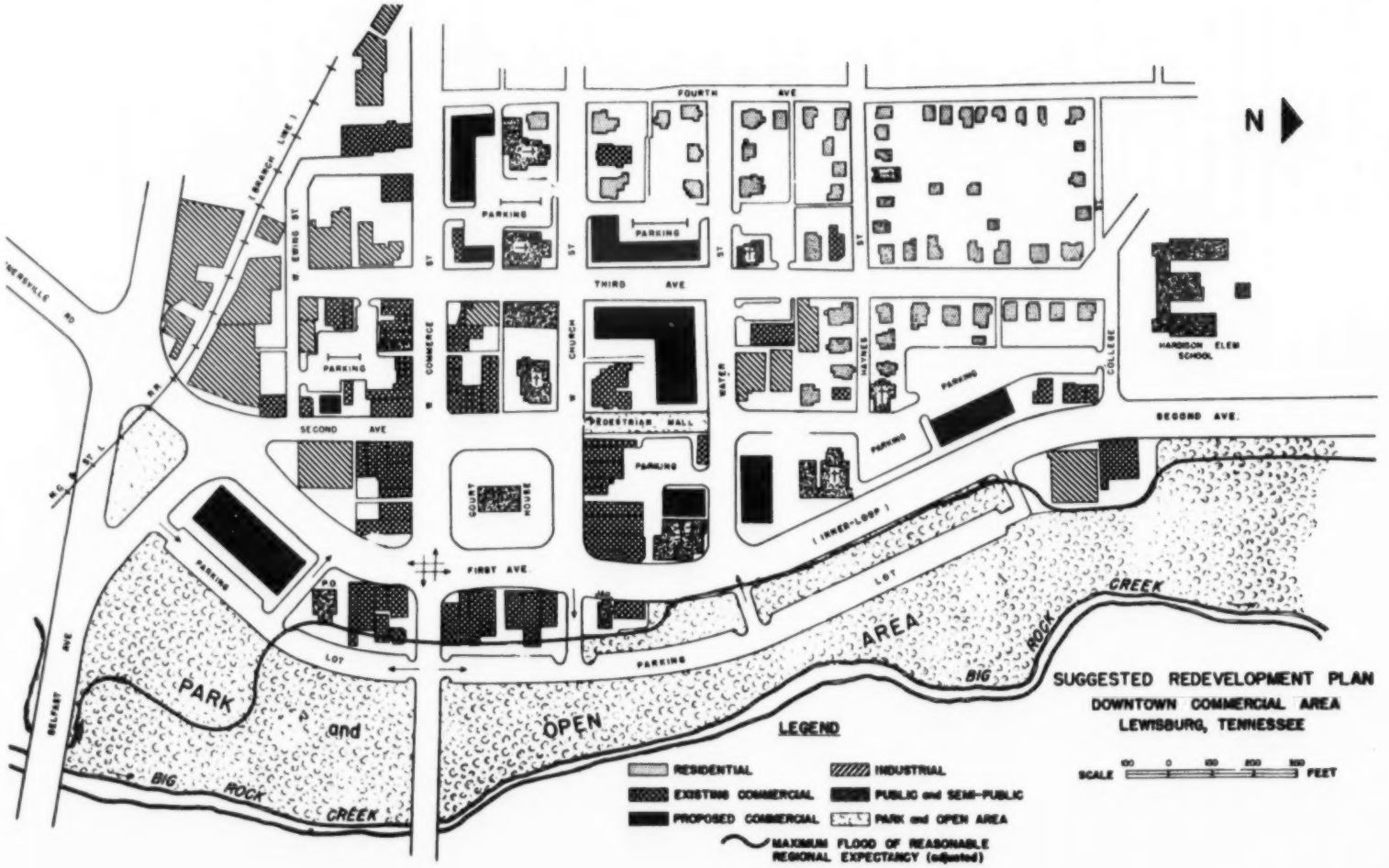


FIGURE 7.--Lewisburg, Tennessee--parks and other types of open land uses which would not be damaged appreciably by flood waters are proposed for flood hazard areas.

to the west for recreation. This basic plan affected all decisions on reservoir readjustments necessary in the town. TVA built a dike to protect low-lying industrial land on the east side of town. In addition, proposals for railroad, street, and utility readjustments were judged according to this same basic pattern. Railroads were to be kept to the east; causeways leading into the town were to be located so as not to prevent access to the navigation channel; public access to the lake was to be provided at points where main roads (the tourist routes) approach the reservoir.

16. A detailed waterfront development plan was completed. Recreation and school plans were prepared. A zoning ordinance was adopted by the city council. Because of the extremely rugged terrain, a topographic map with 5-foot contour intervals was prepared as a basis for the development of the street system on the hilly peninsular town site, and to help in the administration of subdivision standards, center lines and rights of way were established for the major and secondary streets. Recently the city acquired most of the land on the industrial embayment and has prepared a plan for its development. These studies, carried on over a 20-year period, have helped to detail the plan for the town and keep it up to date. During this period the population has grown from 3,000 to approximately 6,000.

17. The significance of this illustration is that state-sponsored local planning assistance programs which started in reservoir-affected communities such as Gunterville have been extended to cities and counties throughout the several states in the TVA area. As a result, the number of local planning agencies in the watershed has increased from 2 in 1933 to over 100 in 1958.

18. Recreation. New recreational opportunities were also made possible by the development of the Tennessee River, and the realization of these opportunities was a result of joint planning between TVA and state and local agencies. Currently the recreation use of TVA lakes totals about 35-40 million person-day visits a year.

19. A major recreation problem has been to assure the general public opportunities for full use and enjoyment of the lakes. TVA approached the problem by joining with state planning and conservation agencies in studies of the basic recreation resources of the entire region, including those along existing and proposed TVA reservoirs. These studies were followed by appraisals of the possible recreational use of specific reservoir tracts in TVA ownership. In a few instances TVA constructed demonstration parks to show the benefits to be gained from such public facilities. In addition to programs designed to meet public recreation needs, TVA works with state and local planning and state park agencies to locate areas suitable for semi-public, private and commercial recreation.

20. Flood Damage Prevention. In 1950, TVA began a systematic study of local flood problems throughout the Tennessee drainage basis. Two conclusions were drawn from these studies: First, local protective works are not economically feasible in an

overwhelming proportion of communities that have flood problems; and second, any complete flood damage prevention program of the Valley requires action at all levels of government. In 1952 a series of discussions was held with state planning agencies to determine how a region-wide program of flood damage prevention could be initiated. It was agreed that there was need for a systematic compilation and analysis of hydrologic and meteorologic data in a form usable in local planning and development activities, and that these data would be useful in other state and local planning and development activities. TVA made available to state planning agencies data on rainfall runoff and stream flow which it had accumulated for use in the design and operation of the Tennessee system of dams and reservoirs. These data were compiled into reports quite different from those usually prepared for flood control or engineering works. The reports were designed to develop an understanding of the nature and magnitude of a flood problem centered in a specific community.

21. As flood data become available, planning agencies study the effects of flooding on community development. Some have advanced their studies to the point of recommending that provisions for adjusting land use to the flood situation be incorporated into the zoning and subdivision regulations. The solutions to local flood problems are not limited to zoning and subdivision regulations. For example, the city officials in Cleveland, Tennessee, expanded their purchase of a school site to include flood-free land suitable for buildings. The land subject to flood is being used for playgrounds and parking space. In Shelbyville and Knoxville, Tennessee, flood data are used in planning urban renewal projects which include relief from flood damages. Figure 7 illustrates a proposal for redeveloping the business district of Lewisburg, Tennessee, to adjust to its flood situation.

22. Conclusion. The cooperative program has been an important force in the region for adjustment to the change from an agricultural to an urban industrial economy. It has extended the benefits of the river improvement program by capturing values which promote the sound social and economic development of the entire basin and adjoining territory. Among these are a vast and growing water-oriented recreation development by states, counties, cities and private interests; industrial expansion supported by ample sources of power, flood control, and navigable river transportation; expansion of basic resources through improved soil and forest management practices; the order growth and planning of urban centers; fish and wildlife propagation and conservation; control of malaria mosquitoes which has virtually eliminated the disease from the region; and improved quantity and quality of water supplies for municipal and industrial use.

United Nations, Economic Commission for Asia and the Far East
WATER RESOURCES DEVELOPMENT IN BRITISH BORNEO, FEDERATION OF MALAYA, INDONESIA AND THAILAND
Part 2C. "Multiple-Purpose River Basin Development" Printed Document. Bangkok, 1959. 135 pages. Maps, Charts.
628.11:711.2 (59) (91)

1. This United Nations report gives basic information on water resources which can be related both to the making of national plans for economic development and also regional plans. Each of these countries have similar problems due to their similar environmental conditions, yet each are different in other related resources, and rate and method of development.

BRITISH BORNEO

2. Need and Possibility of Further Development. The prominence of agricultural activities in the economy of British Borneo is greatly overshadowed by the booming petroleum industry in the territory of Brunei, which in 1957 alone accounted for 99 per cent of all its exports. In contrast to Brunei, agricultural production occupies a dominant position in the economy of British Borneo, since it provides a livelihood for over 75 per cent of the inhabitants and account for 95 per cent of total foreign exchange earnings. British Borneo is far from self-sufficient in foodstuffs. Each year the value of imports of foodstuffs constitutes a high percentage of total imports.

3. Greater land utilization and application of drainage and irrigation schemes to existing paddy cultivation is the basic prerequisite for self-sufficiency in foodstuffs. No assessment has yet been made of soil and land available for agricultural expansion in any of the three territories. The cost of clearing land is prohibitive for the average smallholder, and only when large tracts are cleared with mechanized and governmental assistance, can costs be reduced substantially. The problems that must be solved if it is to increase production of foodstuffs are not materially different from those in other Asian countries, and relate mainly to the lack of hydrologic data on the basis of which schemes can be designed and economically operated.

4. With only one exception no assessment has been made of the hydro-electric power potentiality in British Borneo. The demand for electric service has, admittedly, not been sufficient until recently to warrant the establishment of an investigating organization for assessing power potentialities. Moreover, diesel engine stations, making possible flexible operation while utilizing Brunei fuels, are comparatively low in cost to operate and readily accessible by barge from almost all urban centres.

5. Problems in the Development of Water Resources. There is no greater deterrent in the implementation of multiple-purpose water resources developments than the lacking of design features, economic feasibility or administrative responsibility in projects. In

Figure 1. LOCATION MAP OF BRUNEI, FEDERATION OF MALAYA, NORTH BORNEO, INDONESIA SARAWAK, AND THAILAND

practically all instances, failure can be traced to the inadequate collection of basic hydrologic, geological and economic information. The success of a scheme will depend on the soundness and accuracy of the investigation and on the prudence in the design and maintenance of the project.

6. Summary. An accelerated programme of water resources development is needed if the economic position of British Borneo is to be improved. The present rate of population growth is placing increasingly greater demands on the territories for agricultural produce and services.

7. British Borneo contains not only large oil reserves, but also mineral deposits of metallic and non-metallic character. The extent of these reserves and their competitive importance should be assessed as early as practicable. Today, electricity is the only agent that stimulates economical industrial development; at the present time practically nothing is being done to assess hydroelectric potentialities, except for a reconnaissance of the power potentialities of the Pada river watershed. Before British Borneo can emerge into the field of industrial expansion, it must condition itself by creating a fund of basic data which can be interpreted in terms of potential power supply and used for other multiple-purpose water projects.

8. Modern mining methods depend almost entirely upon the application of electric power supply for their operations. It is in the public interest of the territories of British Borneo to initiate an accelerated programme for assessing the potentialities of low-cost power resources at strategic locations so that wider diversification of industry can lead to an improvement in the trade balance.

FEDERATION OF MALAYA

9. Need and Possibility of Further Development. At present, the Federation of Malaya is far from self-sufficient in rice production; it grows only a little more than half of its total requirements, with the result that large quantities of rice have to be imported every year. This situation is further aggravated by the fact that recent census estimates indicate that the population of the Federation is increasing at the rate of about 3.5 per cent annually.

10. Rainfall in some months of the year is not adequate for rice cultivation, and extended periods of drought often create serious damage to standing rice crops. In some areas, drainage has to be controlled in order to mature rice crops. All these considerations emphasize the need for irrigation and controlled drainage.

11 At the end of the Second World War, after the damage to the drainage and irrigation systems caused by the war had been repaired, the Federation drew up its first economic development plan for the period 1950-55. On completion of the first plan, the second development plan was launched, 1955-60. The plan absorbs the

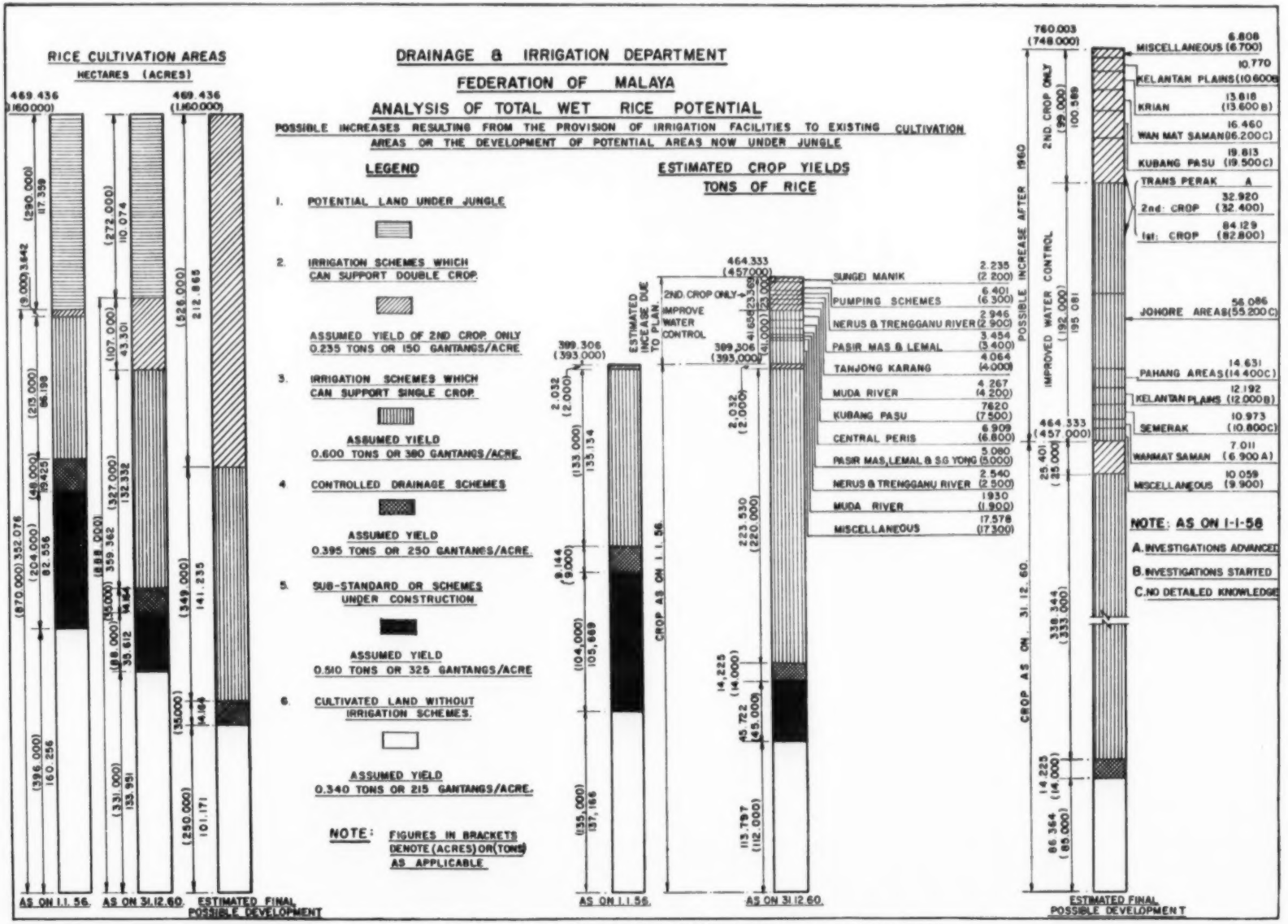


Figure 17. FEDERATION OF MALAYA: CHART SHOWING ANALYSIS OF TOTAL WET RICE POTENTIAL

projects not completed in the first six year plan, and, together with new projects, envisages completion of 45 irrigation projects to improve 88,221 hectares (218,000 acres) of existing land, and to open up 7,284 hectares (18,000 acres) of new land for rice growing, at an estimated cost of M$39.1 million (US$12.8 million). Nineteen drainage projects to improve 52,083 heatares (128,700 acres) of coconuts and rubber small-holdings, including 3,602 hectares (8,900 acres) of new land, at an estimated cost of M$11.1 million (US$3.6 million), are also programmed. In addition M$3.9 million (US$1.2 million) is allocated for river conservancy and other supporting services. The two combined development plans embrace the construction of 61 projects for irrigation, drainage, river conservancy and supporting services to benefit more than 269,116 hectares (665,000 acres) of agricultural land for rice and coconuts.

12. Summary. Rice is unquestionably the most important food crop throughout southeast Asia, yet few countries are self-sufficient: the Federation of Malaya is not one of them. At the end of the second five-year plan, it is estimated that 464,333 tons of rice will be harvested annually. If the present rate of population growth in the Federation continues, annual consumption of rice by 1960 will approach one million tons, and rice imports will have to be increased. The prospects of self-sufficiency are not encouraging. An all-out effort should accordingly be launched immediately to accelerate hydrologic data collection, soil and ground surveys, research and project design of development schemes as envisioned by the Drainage and Irrigation Department's assessment of requirements after 1960. Moreover, soil surveys of the vast peat areas should be diligently pursued to determine whether they can be used for food crops on an economical basis.

13. State governments are urging the Central Electricity Board to outline its land catchment requirements for possible hydroelectric developments in order that they can deal properly with land applications. It is generally recognized that an appraisal of the national hydroelectric potential will be of great value to all concerned. Although hydrologic observations are being made on 81 rivers in the Federation and 120 river discharge stations have been established, the analysis of data from these stations has not been carried out. Furthermore scanty information is available on the effects of vegetation, topography, size, shape and location of catchments, including evaporation, percolation, transpiration and so forth on runoff.

INDONESIA

14. The dense and rapidly increasing population in the country, particularly of Java, has made it essential to speed up the production of food. Such efforts partly as a result of abortive forest clearing in the guise of agricultural expansion, have given added impetus to soil erosion and waste of fertile lands. Erosion in its turn has multiplied many times the siltation problem of river beds. The disappearance of vegetation in the hills has led to floods and to a further loss of agricultural land.

These difficulties have been aggravated by the decline in the country's foreign exchange holdings, deficit financing unaccompanied by any marked rise in output and by the shortage of investment capital and skilled personnel.

15. Certain measures to remedy the agricultural situation are indicated, such as a reform of land management laws. At present, the estate owners have no incentive to expand their holdings, even though they are responsible for the greater part of crop exports. It is also essential to deal with the question of squatters, and to plant trees on worn-out lands in order to minimize erosion. Shifting cultivation should be forbidden. It is responsible for the reduction of natural shortage of water; it increases the reduction of velocity of floods and depletes water supply in reservoirs in the dry season.

16. In the training of technical and administrative personnel there are two cardinal problems in establishing comprehensive training centres in Indonesia.

(1) To eliminate duplication and overlapping of functions among the various government undertakings.

(2) Expansion of plant and on the job training. This is particularly difficult in government departments and small private establishments.

17. To speed up the industrial programme, the Government has established several training centres, and many of the larger foreign owned establishments foster training programmes. However, in spite of the general handicaps, including the shortage of skilled personnel, water resources development can play a major role in improving Indonesia's economic situation. Irrigation schemes are making a substantial contribution to the country's over-all economy. But a great deal more can be done to increase crop yields by judicious measures. Present plans for the extension of drainage and irrigation schemes will, if carried out, just be sufficient to meet needs. Long-range planning should be initiated in order to complete additional schemes on a time-table commensurate with population trends.

18. The need to expand hydroelectric power facilities cannot be over-emphasized. The average annual consumption of electricity per capita is among the lowest in southeast Asia. Evidence of the need for water power resources is exemplified where the Government's generating facilities are at present capable of furnishing only 40 per cent of the power requirements of western Java. Water power, if developed, would also help to expand Indonesia's mining resources upon which the country leans so heavily, but which could yield even more by a nation-wide geological survey of these resources and the commercial importance thereof.

THAILAND

19. Problems in the Development of Water Resources. In the past, development programmes have suffered from the failure of the Government to provide sufficient funds to complete the projects within the time scheduled. In future with a view to ensuring continuity of construction and completion within the economic period adequate funds should be allocated. Sufficient funds should also be allotted by the Government to adequately maintain and operate the projects already completed.

20. The Government at present lacks a definite long-range development programme. The formulation and implementation of such a programme are hampered by lack of satisfactory mapping and sufficient hydrologic data. The Government is now expediting the mapping of the whole Kingdom. It is urged that the assessment of water resources be carried out as soon as maps are available, and that gauging stations be extended to all rivers where gauging is not yet being done. The assessment should also ascertain the multiple-purpose benefits, and should keep pace with progress in mapping. After all water resources have been assessed, a master plan should be prepared for the optimum utilization of the entire water resources.

21. Maximum benefits from water resources development projects can be obtained only if there is co-ordination and full co-operation among the ministerial offices concerned. The initial planning of a project should reflect the knowledge, understanding and interest of all related agencies covering all possible fields affected by the project.

22. In addition problems have arisen because the farmers have not dug proper irrigation ditches on their own land and it is recommended that the government do this or the farmers given an incentive by a reduced rate of land tax. The farmers have received irrigation water free, and are using it wastefully. It should properly be taxed or allocated according to need. The water laws are not enforced and there is willful destruction of forests which is setting off chain reaction through erosion which affects the water.

23. Summary. Thailand's water resources are vast. To date less than 10 percent of its potential has been developed. At the end of 1958, Thailand had projects to benefit an area of about 1,038,000 hectares (4,400,000 acres), with a tentative target benefit of 1,919,000 hectares (8,060,000 acres)--to be realized when all the projects under construction are completed in a few years time. The area benefiting at present comprises 13 per cent of the total cultivated area of the Kingdom.

Hocking, H. M.
SURVEY OPERATIONS IN REMOTE AREAS
The Australian Surveyor, Vol. 18, No. 1, March 1960. Pages 63-70.
711.11 (100)

1. H. M. Hocking is the supervising surveyor with the Department of Territories in the Northern Territory of Australia. As such, he is in charge of surveying one of the most vast undeveloped areas of the world. From his experience he attempts to enumerate, especially for the benefit of the student, the general principles behind the organisation and equipment of survey parties operating in remote areas, where the capital outlay is large, and the dividends of effective organisation and research are, therefore, very considerable.

2. Conditions for Optimum Development of Surveys.

a. When there is a thorough appreciation of the various types of surveys likely to be undertaken, and the approximate amount and frequency of each.

b. When sufficient records and experience of all types of the country concerned to make a reliable estimate of the number of "party hours" and approximate costs involved have been obtained.

c. When the essential suitable equipment for the performance of each type survey involved has been obtained.

d. When sufficient suitable trained labour to ensure uninterrupted work has been obtained.

e. When sufficient communication equipment has been obtained to--

(1) complete control of all members of the party;
(2) effective connections with local stations and his base.

f. When sufficient transport, supplies and spares to keep the party continuously on the job for as long as desired have been obtained.

g. When provisions are made for the profitable employment of the members of the party during periods when his vehicles are being overhauled and when the supervisor is engaged in administrative work.

3. Assessment of Work Available. The success or otherwise of the surveyor's planning will depend upon the accuracy of his assessment, from all available information

and records, of the probable amount of work which will be available in the future, and the flexibility produced into his organisation to absorb the influence of unforseeable economic developments. His assessment will be based on certain fixed items and certain variable factors which may influence, or require the amendment of, the subsequent execution of portions of this programme. Certain fixed items are:

a. The total mileage of unsurveyed lease boundaries and the past average annual requirements.
b. The existence of an administrative programme-such as the large scale conversion of leases with a consequent alteration of some boundaries which may increase or decrease the annual average requirement.
c. The total mileage of unsurveyed stock routes and reserves.
d. The total mileage of unsurveyed roads and highways.
e. The amount of control surveys--triangulation, traversing and levelling--required to complete the major networks.
f. The total mileage of unsurveyed railway reserves.
g. The number of mineral leases unsurveyed and the average annual requirement.
h. The average annual requirements for urban surveys.
i. The amount of land suitable for closer settlement and its probable rate of development.

4. Some of the variable factors likely to affect survey operations are as follows:

a. Economic developments in the pastoral industry.
b. Periodic fluctuations or developments in the mining industry consequent upon the rise and fall of prices, the payment or withdrawal of subsidies, or the demands for new metals, such as uranium, etc.
c. Development of the tourist industry necessitating the survey of scenic reserves and the location and survey of tourist access roads.
d. The provision of special control surveys for various projects such as defense purposes, geological mapping, water supply, oil search, etc.

5. Esprit de Corps. The Surveyor should, prior to commencing, explain to all members of the general location and purpose of the survey, the time he estimates the survey will take, the type of county they expect to find and any other general information he may have. At the end of each day he should discuss the day's work in general, and outline of work for the following day.

CURRENT WORK OF DOXIADIS ASSOCIATES

PLAN FOR THE CITY OF HOMS
SYRIA

Summary of Preliminary Report No. 3 prepared for the Government of the United Arab Republic, Province of Syria

1. Homs is the third largest city of the Syrian region of the United Arab Republic. It lies on a large plain between the mountains of Lebanon and the Djebel Nosaire. The river Oronte runs one km to the west of the town and the Mediterranean coast is about 70 km to the west.

2. Homs is almost equidistant from the two main centers of Damascus and Aleppo and is linked to them by main north south routes, both road and rail. It is also connected directly with the port of Tripoli.

3. The last census was taken in 1925 so population figures are based on estimates. This gives Homs a population of somewhere between 146,016 (official estimate) and 196,000 (local estimate).

4. The small towns of Der Baalbe (north-east), Feruze (east) and Zeidal (south) are within 5 km of the city, and fall well within its economic influence.

5. Twelve km to the south is the lake Katine, formed from the river Oronte. This general district to the west of the city is covered with truck gardens where all manner of mediterranean fruits and vegetables are grown for market.

6. There are now four major industries:

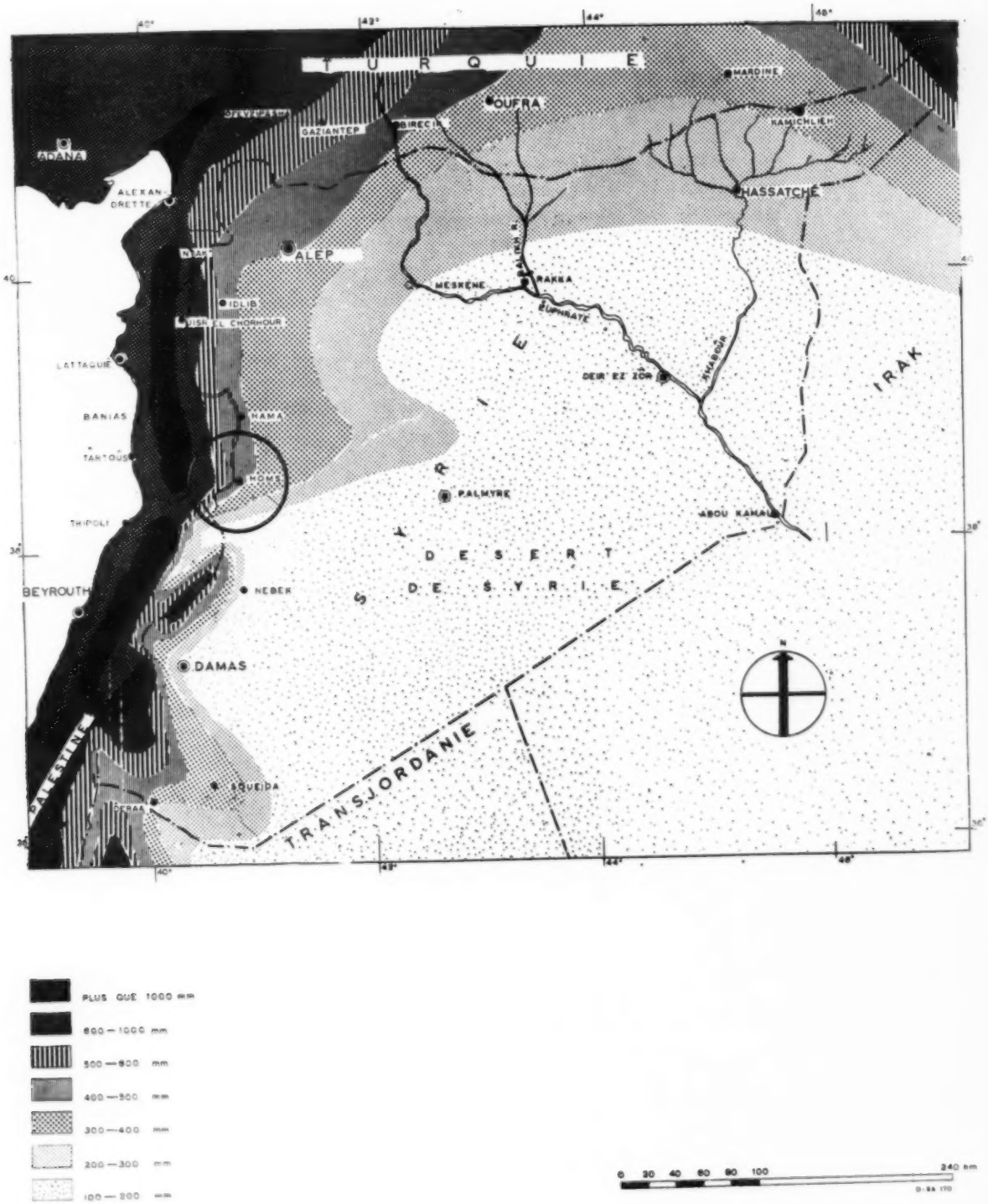
   a. A sugar factory, 4 km north of the city, founded in 1951, employs 650
   b. An oil refinery, 8 km to the west, founded in 1959, employs 430
   c. A dye works, to the south-west, founded in 1940, employs 300
   d. A textile plant, to the north-west, founded 1940-50, employs 110

7. Several other industries are programmed to be built in 1960-1963, the largest of which--a new textile plant--will employ some 700, and the total new factory jobs are scheduled to reach well over 1600.

8. The city, which dates back to the third millennium BC, has passed through many vicissitudes. It achieved some eminence in Roman times and remained under the domination of Byzantium until it was conquered by the Arabs in the 7th century. Both in 1127 and 1202 it suffered severe earthquakes and declined in importance until, under the Ottomans in the nineteenth century, its population was only 20,000. In 1920 Turkish rule was succeeded by a French mandate, and in May 1945 came the independence of Syria.

9. Homs has a dense central area, which was walled around until into the nineteenth century. Its first direction of expansion was northward towards the city of Hama. Then came the railroad, following the line of the river, and the city started to expand to the west over the truck garden lands.

CARTE DE PLUIES MOYENNES ANNUELLES



10. The large cemeteries, formerly outside the town limits to the north, east and west, became engulfed, and indeed became the only open green spaces in the city except for an old fort on the walls of the inner town.

11. The growth of the city has become rapid since the introduction of industry in the second world war and the city is now faced with solving the following problems:

a. An increase in the number of jobs
b. An increase in female employment
c. Stabilizing the primary and secondary types of industry
d. Raising, and stabilizing, tertiary industries

12. Although the schools are relatively good and well attended, 65% of the male and 81% of the female population are still illiterate.

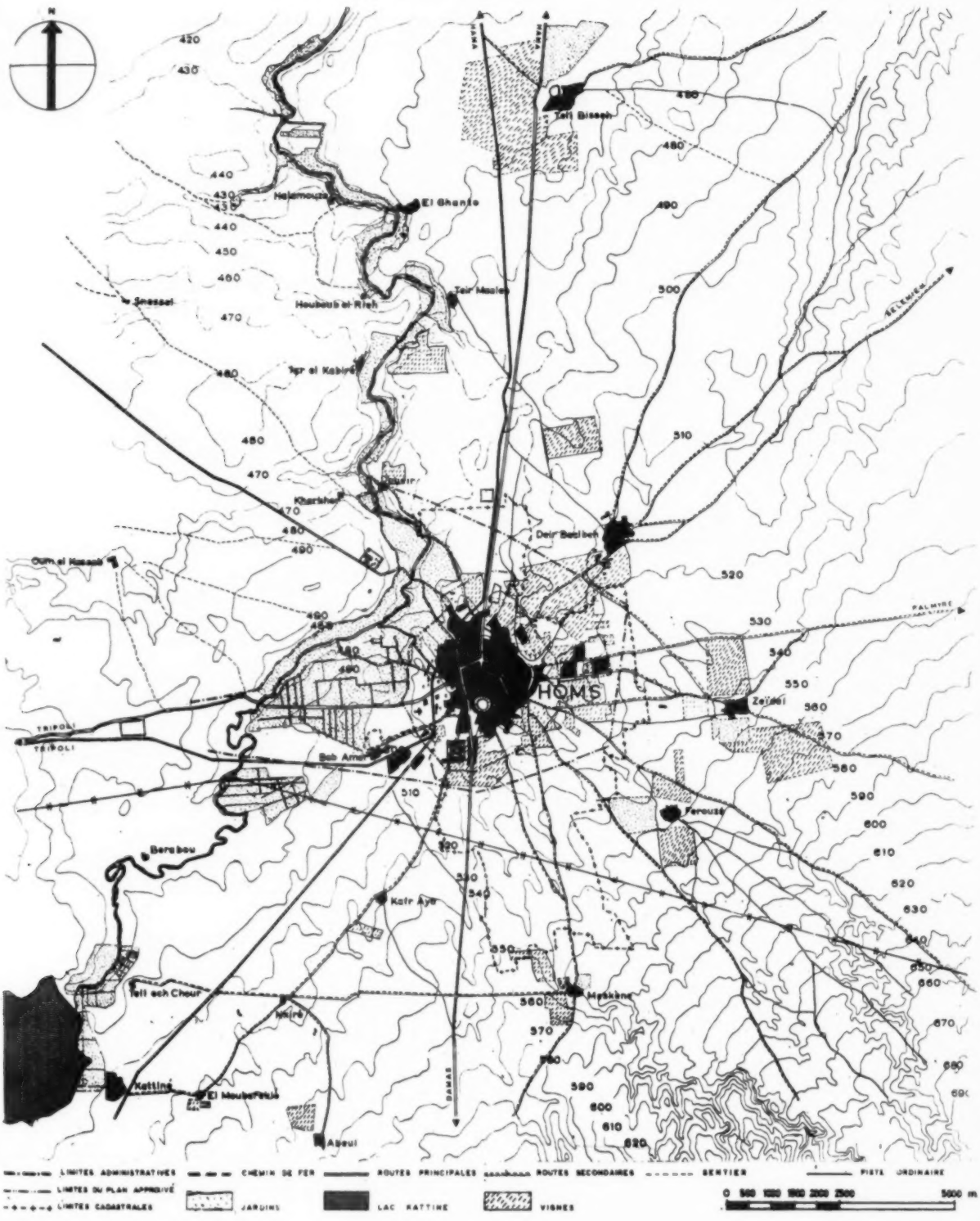
13. Small industries at present employ some 9600 and commerce some 9700. Both are scattered throughout the city, though their major concentrations are in the old city.

14. Few structures of architectural merit remain in the city, other than some of the regligious buildings, but the residences in the old city show marks of well proportioned functional architecture with a keen perception of structure.

15. The average family is around 5.41 and their incomes range much as the following table.

Income Groups	No. Families	Percentage
Less than 600 £S	12.680	35
600- 1200	5435	15
1200- 3000	3623	10
3000- 3600	3623	10
3600- 4800	3623	10
4800-10800	2174	6
10800-15600	2174	6
15600-20400	2174	6
20400 et plus	724	2
Total	36230	100

HOMS ET SA REGION



16. Very roughly the main north-south road, which skirts the old city on its western side, divides the richer from the poorer citizens, though there are areas to the north and on the south-western fringes occupied by peasant squatters.

17. The poorer area, in the old city, is well provided with community facilities despite the denseness of its inhabitations. One finds there old souks with arched roofs, markets open to the sky, closely packed districts of special crafts, the great mosques and local hammams (public bath-houses). As the moslem religion requires frequent ablutions, and Homs is a strict moslem city, the hammam still plays an important part in the life of the community. The major lack is of any open space.

18. The fringe areas, whether well-to-do or squatter districts, are far less well provided with community facilities. Indeed in many areas there is a marked lack.

19. The relationship of residential and industrial areas is most ill-advised. The industries are widely scattered, and mostly to the west of the city, on the good market gardening land and in the direction from which the wind blows 70% of the time. They are also situated in, or near, the districts of middle-class housing and far from the homes of their workpeople.

20. The position of the dye-works and a military camp at the south west corner of the city impedes its natural development in that direction.

21. Transportwise, Homs is important as it lies across the junction of the main road from Damascus to Aleppo and the main branch road to Tripoli. To the east it is connected with Palmyra and the interior.

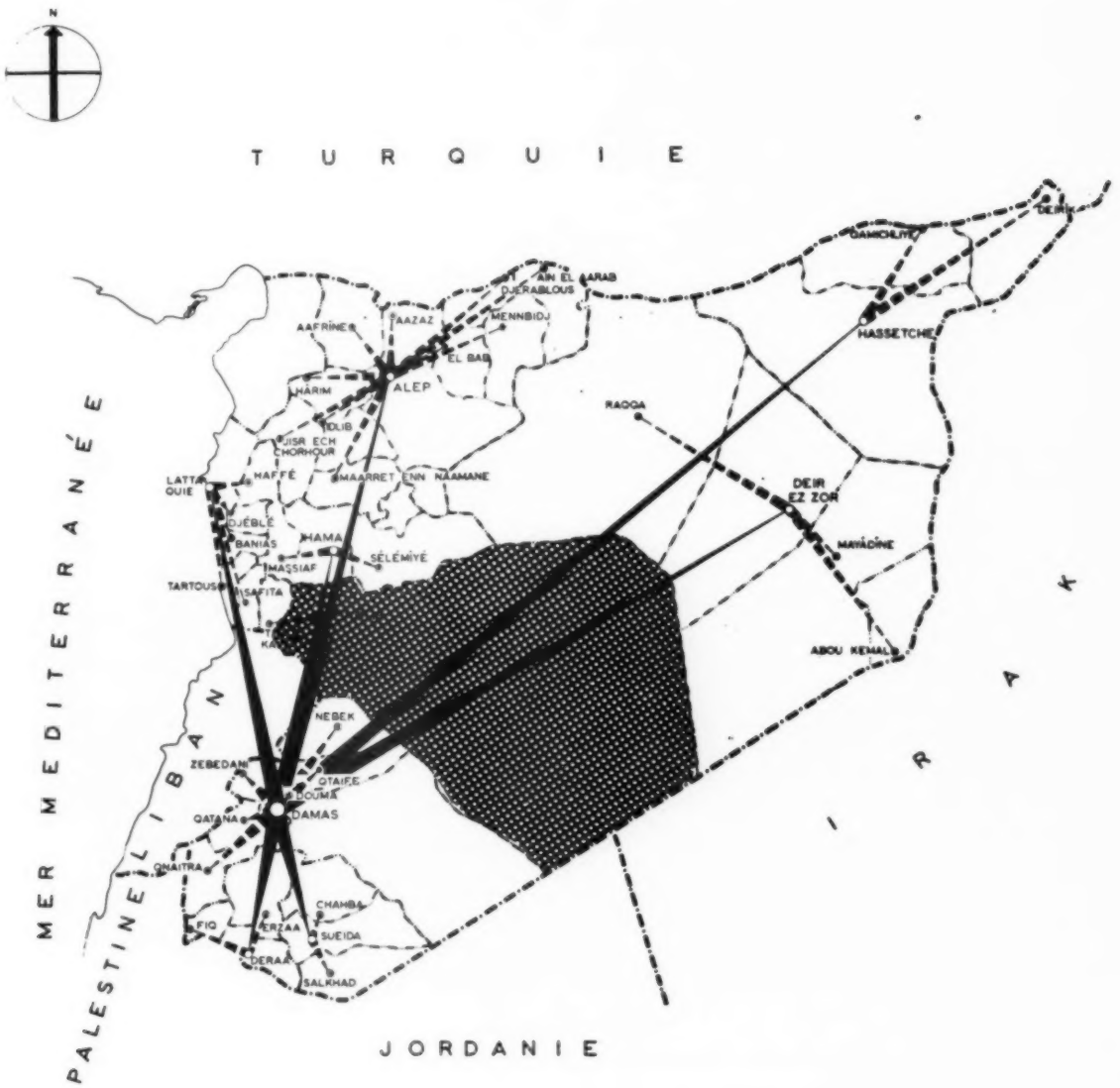
22. The railroad connections are similarly with Damascus, Aleppo and Tripoli, but the Ministry of Communications intends to build an eastward branch which would make Homs rather than Aleppo the entrepot center of the cereal trade from the east.

23. Although in Homs, as elsewhere, the 'great family' is tending to break up, the household size is still large and averages 3.7. Density is also very high--a post-war phenomenon--and averages 2.6, rising to 5.5 in the most crowded part of the city.

24. Twenty percent of the houses are not connected with the water system and 37% have no WC.

25. It has already been said that open space is extremely scarce in the city. Indeed almost the only available spaces, and much used especially by the women, are the large cemeteries.

STRUCTURE ADMINISTRATIVE DE LA REGION SYRIENNE



LIMITES DE MANTAKA

DE LA CAPITALE AU CH-L DE MOHAFAZA

DE CH-L DE MOHAFAZA AU CH-L DE MANTAKA

LIMITES DE MOHAFAZA

0 20 40 60 80 100 200 km

26. The area of the city at present is divided roughly as follows:

Residential areas	277.18 hectares	67%
Industrial areas	62.10	15%
Commercial areas	14.00	3%
Schools, mosques, churches, public buildings, hospitals	16.50	4%
Cattle market and garages	6.50	2%
Cemeteries	25.32	6%
Parks and playgrounds	7.30	2%
Railway stations	6.10	1%
	415.00	100%

Military Camps	56.50 hectares
School of Agriculture	20.00
Nursery gardens	731.00

27. The city has not been idle in attempting to meet the needs of its people as the following table will show:

Year	Revenue	Amount Received from Construction Permits	%	Expenses	Amount Spent on Land Purchases	%
1953	1.513.529	44.258	2,9	1.273.185	13.404	1,1
1954	1.944.399	44.476	2,3	1.656.590	50.182	3,1
1955	1.974.119	55.827	3,3	2.107.453	60.658	2,9
1956	1.699.955	39.288	2,3	1.587.001	20.347	1,3
1957	2.216.507	44.777	2,0	2.394.581	178.740	7,5
Total	9.348.509	228.626	2,5	9.018.810	323.331	3,6

28. While this table also indicates that a great deal of private building has been proceeding it is known that a good deal more is built without going through the procedure of obtaining a permit. One of the largest private undertakings is a project for 1780 dwellings which is being constructed to the west, north of the road to Tripoli, and which will include buildings for public use, a commercial and social center, and all public utilities.

29. Building is also proceeding in the outlying communities and Der Baalbe, Zeidal and Feruze already show signs of an impending merger with Homs. This should be foreseen and planned for.

LOCALITES DE TRAVAIL

30. The continued encroachment on the area of nursery garden land to the west presents a grave problem. This land should be preserved for itself, and also to form a green adjunct to the city.

31. The major land uses in the city are at present organised irrationally and inorganically. Their rational lines of extension and communication have become blocked and means must be found to clear tham.

32. The choice of sites for the new impending new industries must be carefully considered in relation to the direction of the prevailing wind, transport connections, relations with residential areas and correlation with the other functions of the city.

33. At present no line of demarkation exists between the residential, commercial and workshop areas. It is necessary to place the workshops and craft workers in special areas where their trades will not cause inconvenience to others.

34. The cattle market which occupies a large area within a residential district should be moved as it creates many problems of access and inconvenience.

35. The main roads, north-south and to the east, are already overcrowded as they have to take all the city traffic as well as the through traffic. This situation has become aggravated since the establishment of the refinery to the west of the town.

36. The surveys have shown that even to reduce the density everywhere to the average for the whole city, 4000 dwellings or 13000 rooms, must be abolished in the most crowded quarters.

37. Further 22.400 new rooms, or 6800 new dwellings, are immediately necessary to reduce the overall density to 2 persons per room.

38. These two paragraphs show an immediate need for 10.800 new dwellings.

SUMMARY OF PROBLEMS

a. Incorporation of the following residential communities within the city boundaries: Der-Baalbe, Zeidal, Feruze
b. Organized distribution of zones of land use and the formation of integrated residential communities
c. Exclusion of industry from the area west of the city and its rational installation elsewhere
d. Maintenance of the market and fruit garden area (truck gardens)
e. Transference of existing cemeteries and transformation of these areas into public gardens
f. Improvement of local communications
g. Building 6300 new dwellings

VOLUME DU TRAFFIC

h. Reduction of high densities (demolition of 4000 dwellings) and urban renewal
i. Abolish 2000 slum dwellings
j. Improve 3400 dwellings
k. Build new workers housing projects near to the industrial areas
l. Appropriate and rational distribution of public buildings
m. Adequate provision of open spaces and facilities for recreation
n. Extension and improvement of the sewerage system and provision of plants for sewage treatment
o. Extension and improvement of the water supply and other public utilities.

39. The importance of Homs as a center of commerce, industry and communication is bound to develop. It is bound to continue to attract people from the agricultural regions around, and the annual rate of increase is estimated at about 4%, which is approximately its rate of growth between 1940 and 1958.

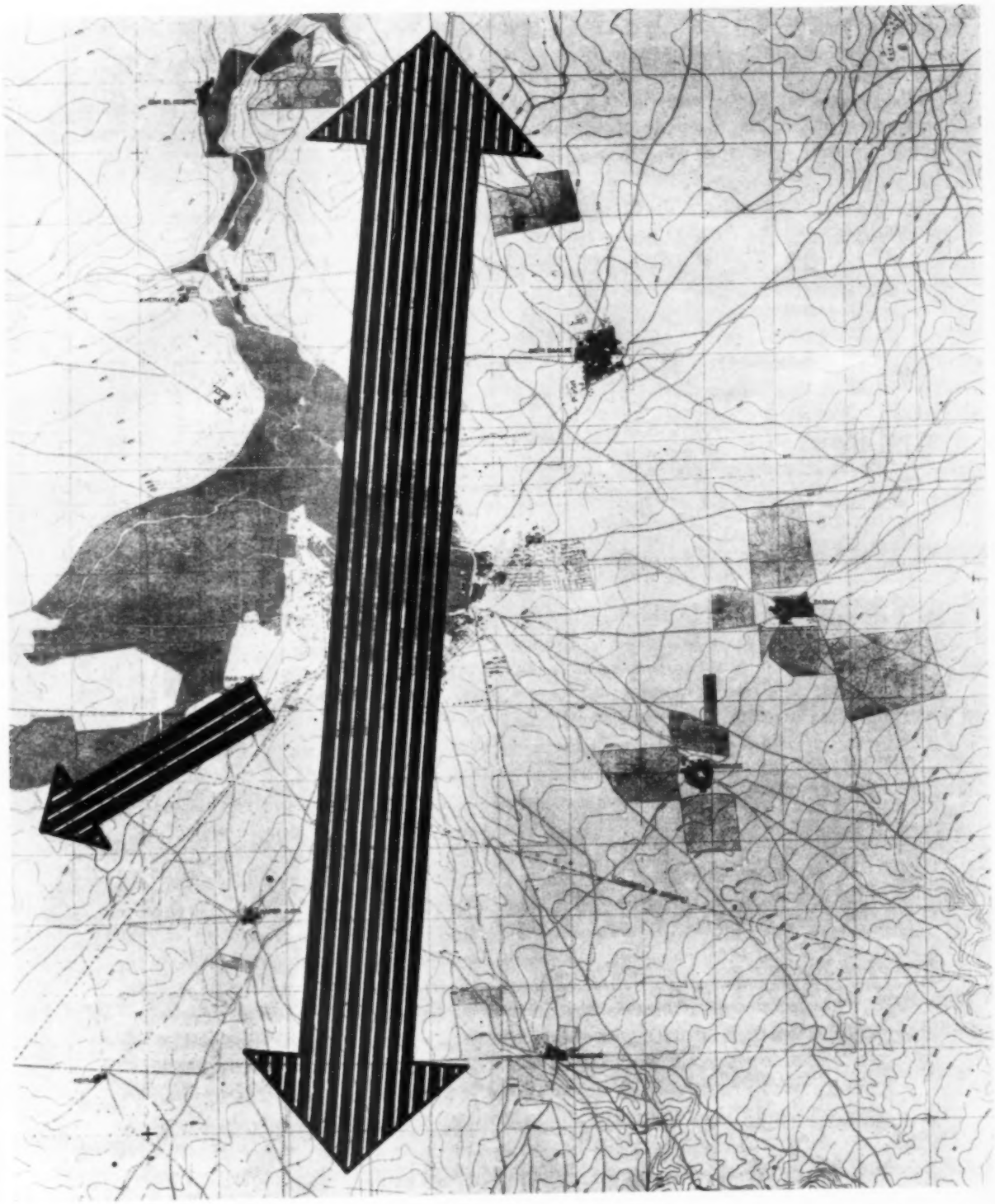
40. This results in a total anticipated population of 660,000 persons in 1989. If the rate were to reduce, this figure would not be reached for 40 or 50 years, but for the purposes of a long term plan it can be taken as a reasonably sound basis.

41. Before establishing a plan it is necessary to take into account the anticipated revenue of the city. It has been assumed in the case of Homs that incomes in the future will tend to be distributed more uniformly. It is therefore anticipated that the percentage of families in the lowest income bracket will diminish and those in the middle income brackets will rise.

42. The following table has therefore been calculated:

Average family income in £S	% Households	No. Households	Average land coverage (m^2)	Net land coverage (ha)	%
1.800	35	46.270	108	499,7	15,39
2.750	15	19.830	135	267,7	8,25
6.600	10	13.220	162	21,42	6,60
12.360	10	13.220	216	285,6	8,80
19.300	10	13.220	270	357,0	11,00
30.800	6	7.932	378	300,0	9,24
45.600	6	7.932	540	428,3	13,19
64.100	4	5.288	720	376,4	11,59
91.500	4	5.288	990	517,6	15,94
Total	100	132.200	245,5	3.246,5	100,00

TENDANCES NATURELLES DE DEVELOPPEMENT



43. The total amount of land needed is therefore around 3246 hectares. About the same quantity must be added for roads, parks, commercial centers, and public buildings in each sector. This gives a rough total for the future residential extension of the city of 6.500 hectares.

44. It is estimated that a further 2.500 hectares are necessary for the social and commercial center, the main parks and cemeteries, industrial areas, railway stations, and, in short, all other functions of the city.

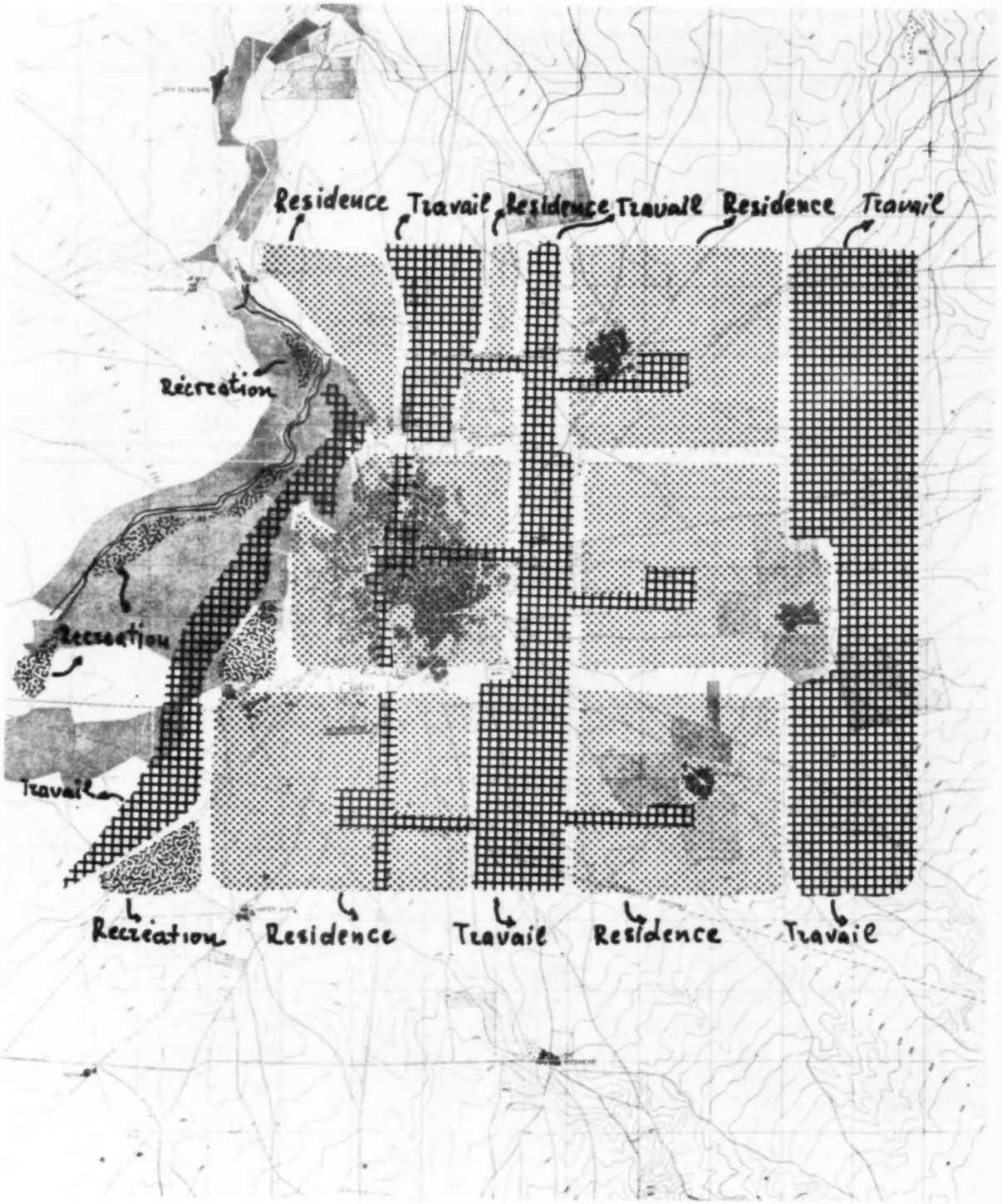
45. On this basis the total area of extension necessary for the future 660.000 inhabitants will be 11.000 hectares distributed much as follows:

Residential areas	6.325 hectares	69.6%
Center	760	8.4
Industrial areas	1.575	17.4
Cattle market	42	0.5
Military Camp	98	1.1
Sports	50	0.6
Cemeteries	110	1.2
Parks and playgrounds	110	1.2
	9.070	100.0

46. The plan incorporates the following:

a. Six Class V communities, three each side of the central north-south routes, which runs to the right of the existing city.
b. This principal axis, or inter-urban route for fast traffic, is built at a slightly lower level to avoid grade crossings with the normal cross traffic of the town, and the main Tripoli road.
c. The important main road to Tripoli has been shifted to the south and meets the Damascus-Aleppo axis at a right angle.
d. The existing commercial development of the old town to the west of the principal axis is prolonged north and south to the limits of this sector.
e. A new industrial area has been created to the east of the town, and an industrial north south road built to serve it. This lies between the main industrial area and the eastern sectors of the town.
f. A new railroad line has been routed along the southern fringe of the city and runs parallel to the southern limit of the outline plan. The passenger station is placed immediately to the west of the central north south axis, just outside the city. The goods station is just outside the southern limit of the industrial zone. The existing north south railroad runs between the western limit of the existing heavy industrial zone and the eastern limit of a light industrial zone.

DISTRIBUTION DES LIEUX DE TRAVAIL



g. Apart from the central commercial district which is enlarged and prolonged, commercial and workshop centers are created as the core of each community class V.
h. The fruit gardens (truck gardens) are preserved and separated from the town along their eastern limit by a wide pedestrian route and a narrow scenic route for vehicles.
i. The existing cemeteries have been transferred to the south-west, north-east and south-east corners of the town, and the sports center placed just outside the extreme south-west corner.

47. The size of the residential sectors (communities class V) is large enough to enable them to be sub-divided into communities class IV, complete with local commerce, schools, religious buildings, recreation spaces, etc.

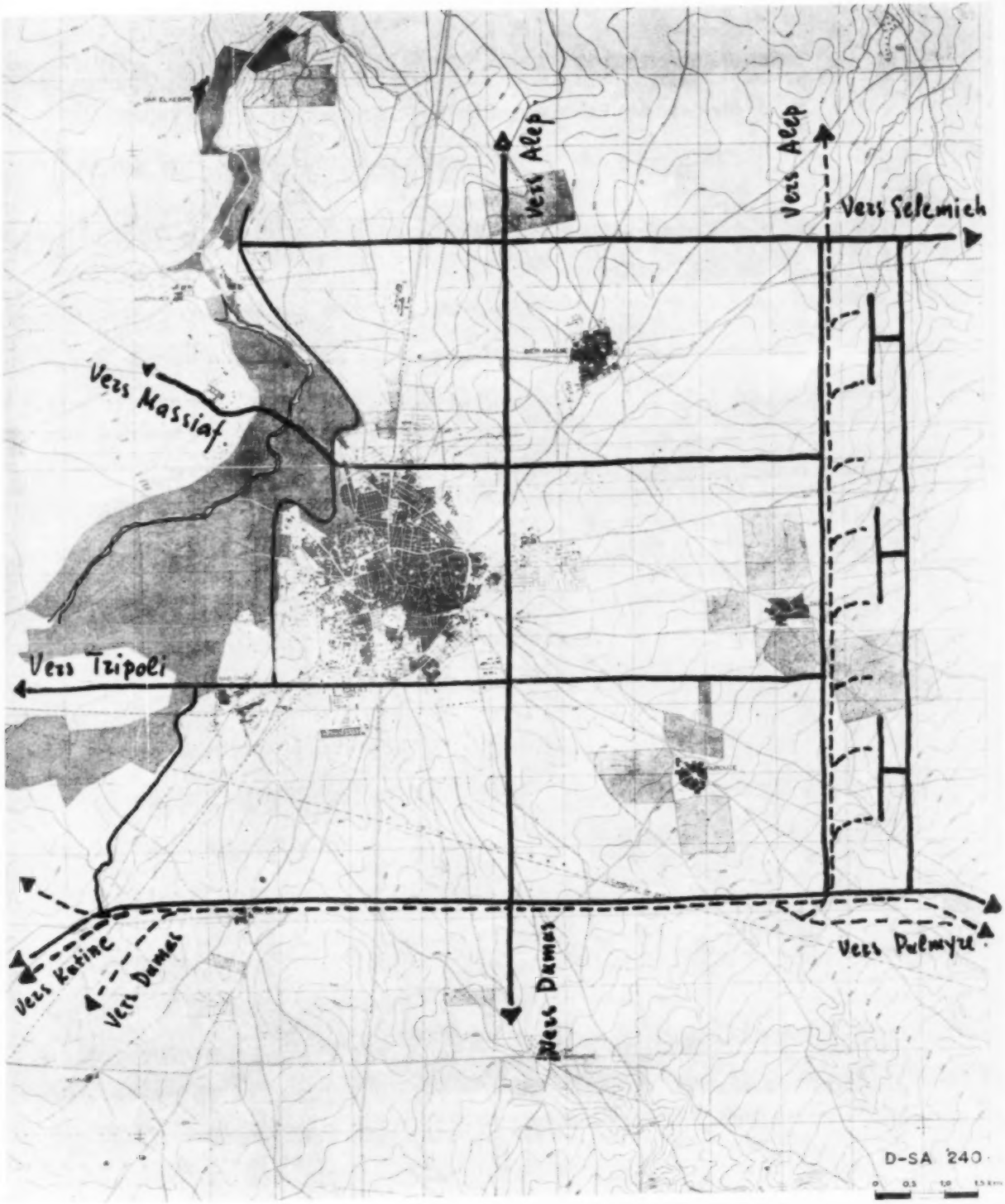
48. As all the new developments have been given a rectangular form, all extensions of the town, other than those anticipated, can be easily accommodated.

49. The application of the whole plan would, of course, come about gradually, in accordance with the requirements of the populace, but the first steps should include:

a. Creation of the new road to Palmyra with its side branches to Zeidal and Feruze.
b. Creation of the new railroad station especially for goods.
c. Construction of a road for the heavy traffic connected with the refinery, southwest of the existing city and just north of the newly routed main road to Tripoli.
d. Selection of a site for the new fertilizer factory.
e. Removal of the present cattle market from the residential district and giving it a more permanent structure in an appropriate locality.
f. Transference of the cemeteries.
g. Direct linkage of Der-Baalbe with the main north-south axis.
h. Organization of the area immediately around the city so as to relieve its interior circulation.

50. The roads shown on the outline plan would certainly not be built immediately to their full width, but it would be desirable to mark out the southern limit of the east-west Tripoli road and the eastern limit of the north-south axis, so as to enable development to commence.

LIGNES DE COMMUNICATIONS PRINCIPALES

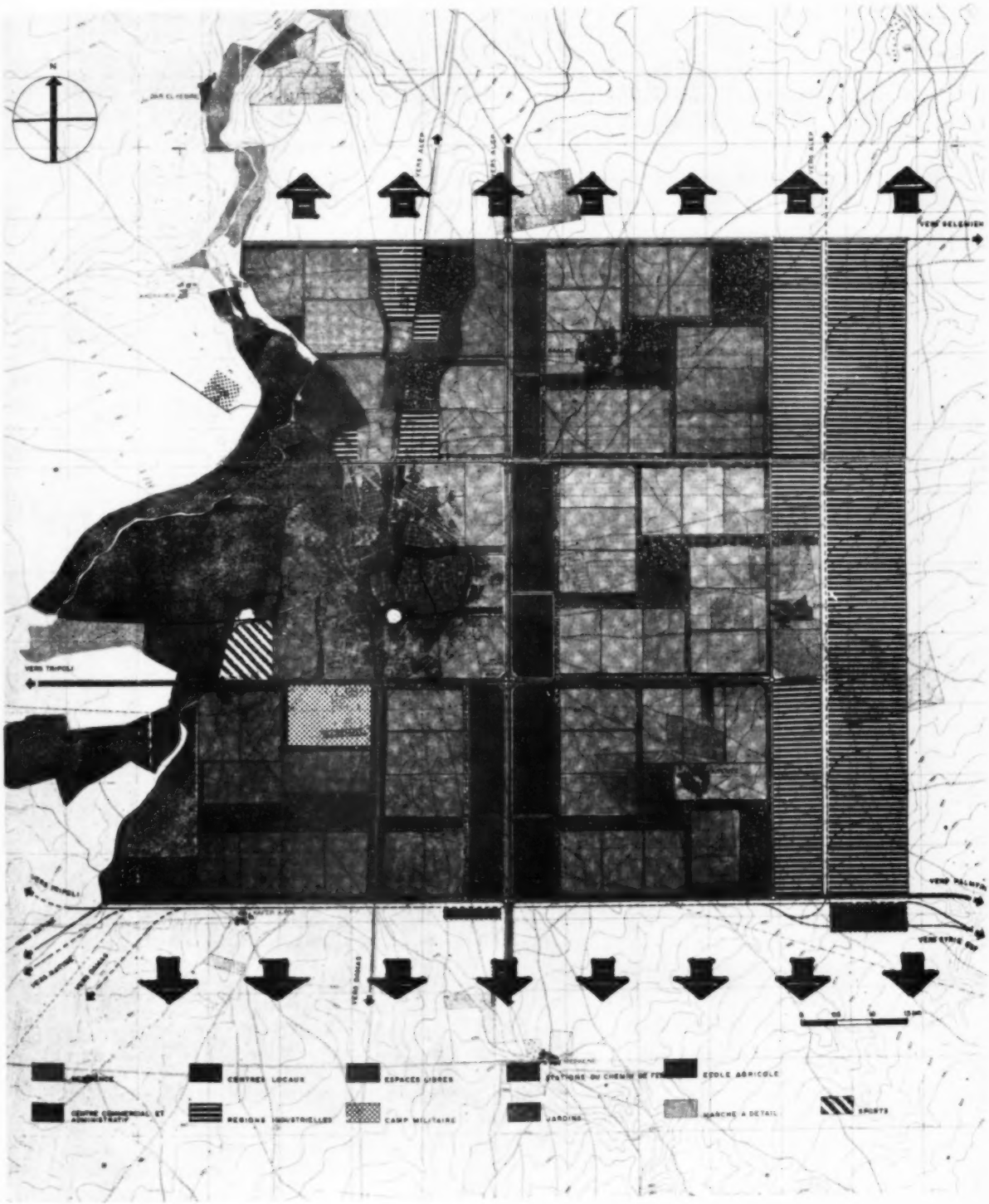


51. It has been calculated that the following funds would be necessary for the programme:

		Syrian Pounds
Government initiative:		
a.	New residential communities for 7000 families	57.400.000
b.	Site development for 7000 dwellings	22.400.000
c.	Improvement of the conditions of 5700 dwellings	15.000.000
d.	Various public facilities	22.200.000
e.	Public buildings	5.000.000
f.	Land acquisition	20.000.000
		142.000.000
Private initiative:		
	Construction of 7000 dwellings on the land mentioned in the item 'b' above	100.000.000
	Grand Total	242.000.000

PLAN D'AMENAGEMENT PRELIMINAIRE

POSSIBILITES POUR EXTENSIONS FUTURES



RECENT PUBLICATIONS

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